

Measuring The Pulse Of DP

By Catherine Arnst
Of the CW Staff

The use of minicomputers vs. larger mainframes is by far the major interest of DP personnel, according to the results of the *Computerworld* poll of reader interests [CW, April 16].

A consensus was also found concerning IBM's entry into the satellite communications area—but at the other end of the scale. Managers, DP managers, programmer/analysts and other members of the computer community consistently rated IBM's entry in these areas as the items of highest interest.

The poll offered 14 areas to be ranked according to preference, with 1 denoting the highest interest, 2 the next and so forth. Obviously, the items with the lowest averages were the items of highest interest.

A total of 468 ballots were tallied, with replies from 88 managers, 212 DP managers,

107 programmer/analysts and 61 others.

It was not required of voters that all categories be ranked; those left blank were not taken into account when figuring averages. Consequently, although 468 ballots were received, only 345 rated minicomputers.

The total number of ballots, however, remained consistent with the ranking of each category by average. For example, minicomputers received the largest number of votes as well as the lowest average, and IBM's satellite entry received the least votes and the highest average.

The training of DP people was second, with the highest interest expressed in the programmer/analyst and DP manager sections.

There was a wide difference between the conversion from batch to on-line systems, which ranked third, and future communication

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M ... I ... C ... N ... C ... C ...

Join us—and Mickey and his friends—in a quick review of next week's National Computer Convention to be held at the Anaheim Convention Center. Complete coverage begins on Page 33.

Software Patent May Go to High Court

By Don Levitt
Of the CW Staff

WASHINGTON, D.C. — The question of whether software can be patented may be heading back to the U.S. Supreme Court.

Acting for Patent Commissioner G. Marshall Johnson, Solicitor General H. B. Cook has asked the justices to review, and presumably put aside, last October's decision by the Court of Customs and Patent Appeals (CCPA) that a software system invented by Thomas R. Johnston of Iowa was patentable when described as "apparatus" [CW, Oct. 9].

Johnston's program, a financial record-keeping system which employs a digital computer to perform "arithmetic on a 'machine,'" Cook argued, is merely an idea and "ideas are not patentable, whether claimed as processes or as products."

Further, "because of its immediate impact on computer programming, [the CCPA] decision would have a serious adverse effect on the computer industry and thus on the economy at large."

"More generally, the decision's implications could have a serious adverse effect

on competition in the use of business and other ideas," Cook claimed.

The Solicitor General's plea—technically a petition for a writ of certiorari—has now been formally filed, however, in another brief filed with the high court by Johnston's lawyer, Morton Jacobs of Millman and Jacobs, Philadelphia.

Because the "new use of an old machine" issue raised in Cook's plea was not considered by the CCPA, the Supreme Court is "without jurisdiction to review" the lower court's ruling, Jacobs contended.

As of last week, the Supreme Court had not announced if it would review either the specific decision on Johnston's patent or the basic question of patent protection for any software.

The CCPA decision, Cook argued, banks to provide basic accounting information to small business clients, based on codes added to the normal string of magnetic ink characters along the bottom of the client's checks and deposit slips. The software provides subtotals by category code as well as more conventional totals on the client's entire bank account during each

Afips' Glaser Sees DPMA Enhancing Future NCCs

By Edith Holmes
Of the CW Staff

SAN MATEO, Calif. — With the addition of the Data Processing Management Association (DPMA), the American Federation of Information Processing Societies (Afips) has gained a society with considerable potential for influencing the technical programs of future National Computer Conferences (NCC), according to Afips' outgoing president, George Glaser.

In reviewing his two years as president of the federation of 15 nonprofit, professional societies, Glaser considered the election of DPMA and of the Institute of Internal Auditors, Inc. one of the two significant accomplishments of his administration.

"Their membership will strengthen Afips significantly by providing an increased voice for data processing users

reporting period.

Cook's plea noted that the codes used by Johnston's system are assigned by the client "analogous to customer's writing 'check' or 'deposit slip' ... a footlong suggested," and the program implements the idea "coats with an ordinary computer in ordinary way."

To this Jacobs countered, "Even under [Cook's] proscriptive argument, the government does not have any rational basis to argue a universal rule that machines built by programmed computers are not patentable."

Two and a half years ago, the Supreme Court disallowed a patent for a program developed by two engineers at Bell Laboratories. The Benson-Tabot patent was rejected because the program involved only "a mathematical formula, a mathematical calculation or mental step" and not a process that could be patented.

In writing the court's unanimous opinion on that case, however, William O. Douglas cautioned, "It is said the decision precludes a patent for any program servicing a computer. We do not so

and members of DP management in our programs, projects and conferences," he said.

"The federation will be better able to represent the entire U.S. information processing community in addressing matters of broad concern to the advancement of computer science and data processing as responsible professions," he added.

DPMA, in particular, will join Afips, the American Federation of Management, the IEEE Computer Society, and the Society for Computer Simulation in planning and sponsoring the now-annual NCC, Glaser stated.

Second Good Year

The opening of Afips' Washington, D.C., office marked the second major accomplishment for the federation during this past year, Glaser commented.

The Afips board of 21 directors and four officers has charged the office with three primary functions: "providing Washington information service to the Afips constituent societies; maintaining contact with members of government agencies and congressional staff and making technology-related expertise available to such groups from Afips and its constituents; and undertaking personal contact, in formal hearings and informal discussions, with government and congressional staff as a means of providing information directly to these groups."

Glaser said he was "pleased that the board of directors has decided to fund the office for 30 months of operation" and suggested the directors would consider further financial assistance if the office serves the purposes for which it has been designed.

"The office should be able to provide constituent societies with information on pending legislation, research grants, legislative hearings and seminars and symposia," he remarked.

Glaser added, "In this, Afips' constant presence in Washington will mean formal present testimony by the federation before agencies and congressional committees, Glaser indicated.

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(Continued on Page 4)

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Competent People 'Becoming Less So'

Glaser Assails DPers for Lack of Self-Development

By Nancy French

Of the CW Staff

SAN FRANCISCO — Most professionals face the same problem as that on her journey through Wonderland: "It takes all the running you can do to stay in the same place and twice the effort to get ahead," according to George Glaser, retiring president of the American Federation of Information Processing Societies (Afps).

Glaser shared some other unsettling observations on the information processing systems environment with Computer Caravan attendees at a luncheon here last week in one of his final appearances before turning over Afips leadership to a new president in Anaheim next week.

Noting that his recent were personal, Glaser passed several hints to the working participants for taking the time to attend, share ideas and solve problems together. Unfortunately, Glaser noted, the majority of DP professionals do not share that interest in self-development and are "not preparing themselves for what lies ahead."

Poorly Qualified DPers

"There are a distressingly large number of poorly qualified people today developing complex systems to which we will all be exposed," Glaser warned. "Those who are competent are becoming less so every day. The technical development threatens to overwhelm us."

Universities are turning out far too few qualified people, he said, and the long-term prospects in DP are not promising enough to attract too many people, he explained.

Finally, "we are having a painfully difficult time achieving the level of professional maturity necessary to help stimulate and reward the continued self-renewal of individual competence," he said.

The problems existing in DP are just as apparent today as they were when he cited them in his keynote address at last year's National Computer Conference, he pointed out.

Glaser called upon DPers to recognize that professional development is each individual's responsibility.

Those who recognize it and do nothing about it will end up in the same hot as those who don't recognize it at all — "in jobs that are not adequately filled with myopia and tunnel vision," he said.

Systems are infinitely more complex today than ever before, he said. We are nearly unable to manage the complexity

that surrounds us and soon may engulf us, he said.

Mathematicians love complexity — they love to break down complex problems into simpler problems and now how to solve, he pointed out. But arbitrary complexity, defined by Frederick P. Brooks, chairman of the University of North Carolina's Department of Computer Science, is another matter.

Quoting Brooks, Glaser said, "Arbitrary complexity is the result of a large number of independent decisions and events occurring over long periods of time which produce cumulative and unpredictable effects on the environment."

Two areas of such complexity are found in the computing environment, Glaser said. First in the operating system where "it is impossible to know what is going on under any realistic set of conditions at any point in time."

A second area of arbitrary complexity can be found in business — "where the environment in which people function is linked to behavior of thousands of individuals whose behavior, in turn, is linked to the behavior of still thousands more."

Rather than learning a new computer language when you have a few spare

hours, why not study some books about human behavior, Glaser suggested.

There are no simple solutions, Glaser added, but surely the first step is self-development — expanding one's horizons and building on one's existing abilities.

Solving problems today takes "innovation," Glaser said. But innovation is "disruptive — it hurts." It changes everything it does, he noted.

It takes a strong individual to cope with human behavior that says "let us expose it (innovation), praise it, do anything but do it," Glaser said.

Glaser Sees DPMA Enhancing Future of NCC

(Continued from Page 1)

any lobbying effort, however, he stressed the information provided to agencies and any other organizations will be restricted to technical information which may be used in arriving at policies by these groups, but which will not constitute policy-generating information.

The director of the office and the office itself will be "Afps' eyes and ears, but not its mouth," Glaser explained. Director Philip Nyhorg will "listen for and identify those opportunities where Afips volunteers might provide information for technical, not political, debate."

In addition, he said, "Afps' Glaser identified two key areas which he felt Afips had neglected this year. Citing the field of 'personal development,' he specifically would like to see the board of directors

launch a project that would eventually lead to an Afips position statement on certification and licensing.

And he indicated the time has come for the federation to decide just how strong a participant it wants to be.

"It's very unfortunate the federation hasn't come out with a statement on issues like certification and licensing," Glaser said. "I am disappointed we have not made more progress in this particular area and attribute much of the reason for our inaction to the care we must take not to step on the toes of our constituent societies."

Without noting that one of Afips' primary functions is "to act on behalf of its constituent societies and their more than 100,000 members on matters of broad importance to the information processing community," he indicated the federation is "a bit timid" as a result of constantly trying to accommodate societies' needs and demands.

"Personally, I believe Afips should be a strong federation," Glaser said. He added, however, that much of the conflict board members face in attempting to decide between collective, "Afips" action and action by each of the individual societies it represents is in "total disarray."

In commenting on some of the outreach efforts of the federation, he commended the work put into the Afips manual for securing computer systems and its job analysis for computer programmers.

"We abandoned our effort to actually create systems after the first committee discussion, we didn't know how to do that," he said. A similar approach was taken with the programmer analysis because there is "no clear analysis of opinion on what computer programmers

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should know about."

Glaser recognized that NCC "is the most visible product of Afips," commenting that he felt the conference "has been extremely successful in permitting technical developments to be revealed — and embodied."

He added, however, that he would like to see an increased public awareness of other services provided by the federation such as the Afips Press and its free brochure detailing its offerings of pamphlets, manuals and books.

Praising the dedication of the people who work for the federation, Glaser concluded that such a federation holds great potential for cutting across the broad set of computer interests existing on a national level.



The federation's Washington office "will be Afips' eyes and ears, but not its mouth," [Director Philip Nyhorg] will listen for and identify those opportunities where Afips volunteers might provide information for technical, not political, debate."

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Minicomputers Take First Place In CW Poll on Reader Interest

(Continued from Page 1)

options, such as all-digital nets and satellite services, at 11.

This seemed to indicate that, while DP personnel are concerned about the immediate problems in the communications field, they are also anxious to both improve money and increase the efficiency of their operations; there is little interest in the communications area itself as far as theory or future developments are concerned.

Vendor support and enhancement of operating systems received a surprisingly high average of 4. This probably derived from the same reasoning that ranked batch to on-line third — DP personnel are currently most interested in ways to increase the efficiency and monetary savings of their present operations.

The movement toward distributed processing ranked fifth overall and probably owed its high rating to the association many DP people make between it and minicomputers.

It was of especially high interest to those who placed "other" as their job definition, a category dominated by educators and those involved in the computer industry itself. This group placed distributed processing second in their list of interests.

The only category involving IBM that ranked in the top half of reader interests was future IBM products after the 370 line, which was sixth. The government's antitrust suit against IBM received little interest at 12 and, as mentioned above, IBM's entry into satellites struck out completely.

For the small amount of interest in future IBM products was primarily from the "management" and "other" sectors of the industry.

Standards for programming languages held the middle ground with a rating of 7, a tie for fifth place with the others in the individual categories except programmers/analysts. This group ranked language standards first and, because of their high interest, standards received the second largest number of responses overall.

Budget reductions, "professionalism" and the like, the concern of consumers and people and possible privacy regulations on private data banks had averages less than a fraction apart, ranking 8, 9 and 10 respectively. Licensing, however, did receive a large number of comments from people

Maryland Senate Kills Price-Marking Bill

ANNAPOLIS, Md. — The Maryland bill which would require supermarkets to mark prices on all items, even those containing the Universal Product Code (CW, Jan. 22), has died in a state senate committee.

A similar measure, however, has passed the House and has a good chance of becoming law, according to Rep. Richard F. Kelly Jr. (D-Hazel Crest).

The Maryland bill died when Senate Economic Affairs Committee Chairman Harry McGuire decided not to bring it up for a vote, according to Ellen Haas, president of the Maryland Citizens' Consumer Council.

Six of the nine committee members had said they were in favor of the bill, she added. McGuire was unavailable for comment.

Kelly said the aim of the Illinois bill is to protect the consumer who wants to compare food prices and to save "thousands of jobs for retail clerks in Illinois that would be eliminated if this system is implemented."

"This is a more inappropriate time to increase the unemployment in our state," he said.

claiming it was not an issue, while others favored marking it 999 on their list of interests or a variation thereof.

Although privacy only ranked 10, this is an improvement from three years ago, when it probably should have been considered an issue. This could indicate the computer industry's growing awareness of its responsibility to the public as well as the business world.

But the other issue dealing with public concerns — the consumer problem created by electronic data transmission systems (EDTS) and the Universal Product Code (UPC) — ranked very low at 13.

These rankings were based on total responses only. When broken down by occupation, some interesting discrepancies appeared between the four groups, and these will be discussed next week.

Going Once, Going Twice...

BOSTON — A \$15,000 Digital Equipment Corp. small business system will be going under the gavel at this year's Channel 2 auction here.

The DEC Datasytem 310 will be right in there with the antiques, 30-lb bags of jelly beans and autographed baseball cards hawked at the week-long auction event, which raises money for WGBH-TV, an educational television station here.

The DEC machine, the largest single donation in the auction's history, will be put through its paces each night during the May 30 to June 7 event. It will be sold to the highest bidder on the final night.

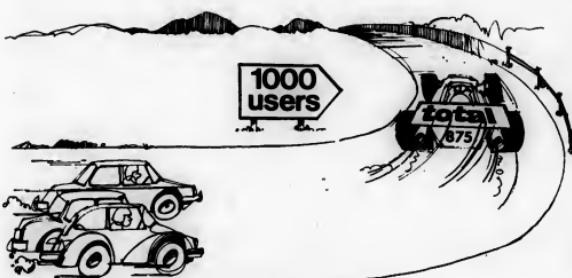
The buyer will own a system built around a 16K DEC PDP-8A processor; a VT50 CRT with cursor control and numeric keypad; a floppy disk drive with 570K characters of storage; and an LA36 read-only 30 char/sec printer.

The package also includes the DEC COS 310 operating system and three weeks of training for a buyer's staff member.

In addition, DEC will provide installation, three months of hardware warranty and the privileges due any DEC user, according to Lee Katz, promotion supervisor for the firm's Business Products Group.

The auction may be a chance for a user to pick up a 310 at bargain prices, he said, but added he hoped buyers would view the auction as a chance to make a tax-deductible contribution to the television station.

M.I. Systems, Inc., a consulting and custom systems house that specializes in mini- and microcomputer applications and interfaces, will be donating about \$250 worth of its time for bid, according to Barry Milberg, the firm's president.



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Personalized DP Diets Wage Battle of the Bulge

By Catherine Arms
Of The Atlanta Journal

Stillman, Atkins, Weight Watchers join these famous methods used to shed pounds by the 60 million American adults who are more than 20% overweight.

Last year, some \$1.2 billion was spent in the country on products and services designed to wage war on fat. Some companies are trying to cash in on this market with the weapon of modern technology — computers.

Computers have been used for some time in aiding menu and diet planning at hospitals, but a few commercial companies have taken the practice a step further by marketing personalized diets for the general public. The idea is to help the weight-conscious consumer slim down with his own personalized diet.

At Nutrition Data, Inc. of New York City and Time Pattern Research, Inc. of New Jersey, both use the same method: a dieter fills out a questionnaire that is

fed into a computer programmed to print out a menu specifically tailored to that person's needs.

Nutritional Diet asks 50 questions concerning weight, height, age and the dieter's likes and dislikes in food. From the answers, fed into an IBM 360/40, menus are drawn up for 30 days, each including a breakfast, lunch, dinner and dessert.

Joel Green of Nutritional Diet said every menu plan is different and includes how much as well as what kinds of food to eat.

The diet is both weight reducing and fully nutritional, he claimed, and he feels its attraction is that a dieter eats only foods he likes, and the meals are full enough so the dieter won't feel hungry.

Chances to Make Money'

The company came out with a computer diet because "it was a great chance to make money," according to Green. It bought the basic diet plan, then modified and spent about a year adapting it to the computer and making it more palatable. It's marketed

through mail or direct mail, is available nationwide and costs \$6.95.

Green said the diet has been successful and, although it may not be the best, he personally would attest to its value. "I lost 50 pounds over 3-1/2 months, and a number of my friends lost almost as much."

The Cadence Computerized Diet marketed by Time Pattern Research is another personalized diet and was designed by Dr. Georgia Faludi, director of the Obesity and Diabetes Clinic at Hahnemann Medical College and Hospital in Philadelphia.

Through her experience in the nutrition field, Faludi found most available diets are not reasonably sound because they are so broad. The best diet is designed personally for the individual through working with a doctor. Or, as she put it, "You can't have a pair of shoes for every pair of feet."

However, the cost of such a method is often prohibitive and impractical for those without access to an obesity specialist. Faludi's solution was to work in cooperation with Texas Instruments Research, a company already marketing computerized astrology and biorhythm charts, to duplicate as closely as possible the technique of designing a diet plan through a personal interview.

The result was a form asking 38 questions and listing 200 food items which could be marked as to preference.

Bernard Green of Time Pattern Research also decided to develop Cadence because of the tremendous interest in dieting in this country. What was needed, he felt, was a sensible way to take off weight and keep it off without using unusual foods, is not dependent on exercise and doesn't present a danger to the dieter.

The firm rejects any applicants who should be under a doctor's care or for whom they can't provide nutritional information and diet, about 10%. They also offer a money-back guarantee if not satisfied.

21-Day Menu Plan

The questionnaire is run through an IBM 370/145, which prints out a 21-day menu plan. Beside including the types of food the dieter likes, the diet also is designed around individual needs. For example, it's large meals or light snacking.

The diet is basically balanced meals, Faludi said, and attempts a relatively slow loss of weight (about two pounds per week), which she feels is the safest method. There is no need to count calories; if a dieter follows the meal plan, he should lose weight, she added.

Cadence has been available since January 1974 at a cost of \$12.95. About 10,000 to about 15,000 plans have been sold so far. The company is currently working on a follow-up to be used after an ideal weight has been reached in order to maintain it.

Faludi believes the best diet of all is still "simple willpower." But in a country of chronic overeaters and underexercisers, consumers are possibly one method for fighting fat.

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Larry Constantine — considered the leading authority in the area of Structured Design. Co-author of the seminal work, "Structured Design" in the IBM Systems Journal. Incidentally, "Structured Design" is only the second article ever published by an outsider in the Journal.

Bill Plauger — authority on minicomputers and microprocessors. Co-author of the "Elements of Programming Style."

These are just three of our Seminar Instructors. We have others. All with backgrounds that would make your mouth water. Our client list reads like a Who's Who of American Business: RCA, GE, Xerox, AT&T, Sperry Rand, Polaroid, Borden, Dupont, Bell Telephone Labs, Pfizer, Merrill Lynch, Honeywell, DEC, Burroughs and the aforementioned little guy, IBM.

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Editorials

An All-IBM Capability?

When an IBM product director talked about the need for multiple interrelated processors at the recent Interface '75 conference, data communications users were listening.

Up to now, the real champions of multiprocessor networks have been the minimakers. Their big advantage over the larger mainframe vendors is they had lower cost equipment. The lacking expertise had been in the area of network systems support in which the mini vendors were traditionally weak.

IBM had been edging into the total teleprocessing domain for some time, first with its specialized industry-oriented terminal systems. Then it announced its Synchronous Data Link Control (SDLC) protocol designed for higher speed full-duplex networks including satellites and digital networks. And finally it announced its intention of becoming a satellite carrier.

IBM also outlined a master teleprocessing environment based on a combination of SDLC together with its Virtual Telecommunications Access Method (Vtam) and the Network Control Program (NCP). The overall grand design was called System Network Architecture (SNA).

Since the first basic announcements, there has been precious little detail about the SNA environment. There have been a few preliminary implementations of SDLC and amid reports that much of the SNA design concepts were not yet operational.

It is now obvious terminal-based systems connected with SNA common control are very much a part of the configurations being charted for tomorrow's user by IBM. The entire package will provide the user with impressive DP power at the farthest points of its corporate network. It is also obvious some of the network control now in the hands of the user will revert to IBM through its remote maintenance concepts.

If IBM is really serious about generalized networking concepts that will allow any terminal in a network to talk to any processor in the network, it will have to provide a combined hardware, software and transmission capability to the user. It is still to be determined where the dividing line between data processing and communications facilities exists in such a total network.

Meanwhile, users planning their data communications networks will have to decide whether an all-IBM computer/communications capability is what they really want.

Before the Crash

The nation's developing automated air traffic control system should be closely scrutinized by Congress to determine whether recent charges claiming it is unsafe are true.

The undertaking needs careful study because the consequences of an uncorrected bug are potentially fatal on a massive scale.

The system should not be used until the extent of the problems can be discovered and corrected — or until the reports of the bugs are proven unfounded.

The flying public deserves the protection that would be afforded by such a study and it should begin before a major accident makes it mandatory.



'Bug or Two Still in the System, I Guess . . .'

Letters to the Editor

Universal Communications Net Not Planned by IBM, Cary Says

The editorial headlined, "Remote Maintenance Appeals" [CW, April 9] referred to "industry experts who see the IBM domestic satellite plan as only one point in a universal IBM communications system."

I don't know who the experts are, but I can assure you they are wrong.

Also, I was particularly amused by the phrase, IBM "has only [emphasis added] to convince the appropriate postal telephone and telegraph agencies that it should become the keeper of the satellite communications . . ."

Even an elementary knowledge of the telecommunications policies of the various European countries should tell you that is unrealistic.

Frank T. Cary
Chairman of the Board
IBM
Armonk, N.Y.

Proven, Non-IBM Systems Abound

It is a credit to a publication when it is impartial enough to publish totally blindfolded, unresearched opinions in the name of fair press. However, after reading G.H. Berger's letter [April 23], I felt compelled to reply with some facts. Contrary to Berger's belief that only IBM has "thousands of successful systems," NCR, as one example, has over 5,000 Centurys and over 8,000 3000s in use throughout the world. The fact that these are satisfied customers has been ascertained by Datapro in an independent study.

I assume Berger is in a position to make a choice in equipment. I sympathize with his employer, as it is obvious that Berger, unable to analyze his boss's research results, allowed sheer numbers to influence his decision.

Had he looked beyond his own prejudices, Berger would have found there are other manufacturers that have comparable proven systems with excellent and often free support at a considerably lesser cost to his employer.

But then Berger isn't paying the bill, is he?

Leonard Lafrance
Walnut Creek, Calif.

Manager in a Special Category

If Computerworld gave a prize for the most asinine letters it received, G.H. Berger would most hands down.

The marketing people for non-IBM companies have for 20 years known about the many pre-dicted, stupid, self-centered empire builders that call themselves "IBM managers." However, until

now, very few would admit it, especially in writing.

With most people in Berger's category, the salesmen had to scratch for clues like "I am not married to IBM" or "I have an open mind." The dead giveaway was when he answered his phone, "IBM Department."

Over the past years, I have encountered fewer people like Berger, but it's nice to know a few "IBM managers" still exist. Notice I did not call them "IBM managers."

I ask just one thing of Berger, since at least he is honest: that he show his letter to the president and sales manager of the company that hands him his paycheck.

Good luck in finding a new employer!
Ed McDermott
Cleveland, Ohio

Only 15%, Not 28%, With Lord

So Kenniston W. Lord Jr. must have the last word [CW, April 23]. He's impressed with his 28%. Let him be.

His conclusion is appealing and no doubt will attract some of the nonthinking "secondary and tertiary readers . . ."

However, his letter reminds me of a little boy who lost and then wants to play for two best of three. He has lost four out of seven, then . . . where does he end? I remind him that the people who lost and demands a recount. It also reminds me if you tell them often enough and loud . . . "And lastly it reminds me of the many minority groups who are obtaining their goals because the majority is afraid to take a stand for fear of being tagged as racists, or . . . about giving up their rights without justice, etc., even when the majority is right."

Hogwash and double hogwash! He doesn't scare me with his trumped statistics and licensing pursuit threats/innuendos.

Jesus said, "He that is not with me is against me." He is not with 12-301. He cannot truth against his percentages to 15% because CW [April 2] reported 13%. He didn't vote on licensing.

This subject of licensing has the all-too-familiar aroma of other asinine innovations for the public's protection. The last stench is still lingering — remember how the previous administration treated the "national security"?

The wind still comes out power and greed under the guise of the public's welfare and professionalism.

Karl G. Gordon

Waterford, Pa.

(Other letters on Pages 11 and 14.)

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Letters to the Editor

Fortran an Overkill; Good Languages Exist

It is good to see a programming language that has been developed especially to simplify structured programming ("Simple" Backs Structured Tests," CW, April 91).

Fortran, however, does not seem to be the appropriate base language. For one thing, it is about as unstructured as you can get.

Even though Staple was developed "by utilizing conventional Fortran syntax," Fortran barely has a syntax at all.

Isn't it overkill to develop a structured language when there are several others that are very good, such as Algol 60 and especially Algol 68?

Paul Konig

Appleton, Wis.

'Isn't IT Wonderful?'

In reference to Thomas Shafar's letter promoting an "English-like" IT statement (CW, April 91), programming is a discipline which requires logical organization with specific references. The overuse of pronouns

and vague phrases causes many communications problems with English.

If IT is used as IT is usually used, it can lead to many problems. IT also has IT's merits as well as its faults. It can save time if IT is used as you intend.

In this case of mediocrity, IT is wonderful to see IT do what is expected of IT — whatever IT is! IT can be the forerunner of a whole new school of ambiguity in programming! Some day we may be able to say "IT is a 'thing'" until we are forced to say "END" IT" "ANYWAY."

Allen P. Memby

Somerville, N.J.

Software for IBM 1130

In response to Jean-Jacques Reuter's letter (CW, April 91) the best tape software for IBM 1130 machines is furnished by Brown Company in Providence, R.I. Consider with Saksoda. This assumes tape drives have been furnished by IBM.

For packaged software such as sort programs, we have generally found DNA Systems in Flint, Mich. has a wide selection.

L. F. Wygant

Chicago, Ill.

Doctors Shift Billing Problems Onto Service Bureaus

One of the most well-supported DP services is in the medical billing area — particularly in direct billing. Nowadays, billing of medical patients, particularly insured or semi-insured ones, is one of the most complicated modern technology has produced and one which has spawned many complaints about computer arrogance.

The problem is a result of the apparent inability of the system designers to realize that a bill which may not need to be paid really isn't a bill at all — no matter what it says regarding balance due.

The Taylor Report

By Alan Taylor, CDP



Instead, it is an irritation and worry. People that get these bills get a poor image of the doctor(s) concerned and his apparent unthinking materialism. So, is it no service to the doctor-patient relationship to let the patient not easily put to one side once too often and so, hurt the cash flow as well as the relationship?

Both of these facts should be — but don't appear to be — taken too seriously by the system designers.

Please Disregard

Figure 1 shows some of the problems that can occur on a first bill. This bill is included in a series of bills from a doctor who "We are on an automatic billing system . . . If you have provided us with the proper forms, please disregard any bills you may receive from our computer . . . until your insurance company notifies you have made

payment."

This is all fine and dandy, but it leaves one in the dark about whether the doctor has in fact got the proper forms, have made a claim, etc.

Moreover, this notation is not on the bill itself and can be easily missed. The bill is poorly designed in some ways.

If used as directed, the patient would lose:

- The reference number.
- The doctor's name, which he probably knows.

- The telephone number and extension.

- The billing date.

None of these is unimportant to a properly kept set of records. It is also important to know whether the doctor or the service bureau have reason to be proud of. Noticeably, the service bureau does not put its own name anywhere on the bill.

Balance Due

Figure 2 shows another later version of the same problem, from a different set of doctors who don't even have their individual names showing. Here the note design is even better than that in Figure 1, but the designer has apparently forgotten that the patient and the person responsible for the bill may not be the same person. The policy holder's name does not appear at all.

Here the biggest legend is "balance due," although, quite obviously, payment of the amount claimed as due would be proper only if the doctor had either established a right to bill both the patient and the insurance company or had ordered the insurance company to pay the patient directly.

Neither of these situations appears to be the case, from the constantly repeating (and, therefore, spacewasting) comment,

And Having Writ Moves On

...Nor all your Petty nor Wit
Shall lure it back to cancel half a Line.
Nor all your Tears wash out a Word of it.

Word has come of the untimely death of Stan Gill, one of the great world figures of software and one of the best loved of British computer pioneers. In spite of almost 30 years in our field, Stan was only 46. He was in apparent good health at 11pm 9th in Stockholm, where I saw him last, and the ugly news was therefore doubly unexpected.

Stan was the least hardware-oriented of the three programmers, (Wheeler and Gill) who in 1950, he and Maurice Wilkes by then, and Dave Wheeler had been at Illinois working on the "good" ILLIAC, but had not at that time met Stan. How vividly I remember the small group of what we could today call systems programmers at IBM's Folkestone, writing the operations manual for the Defense Calculator (later the 701, around which Share was organized), passing the slim brown book around and discussing the then-new subroutine entry technique! That gang included Nat Roederer, Werner Buchholz, Bill McClelland — and me, as a sort of simulated customer.

Later, when I went to England in 1954, I met Stan for the first time. He was easy to know; warm, friendly, informal. He went from Wilkes' shop in Cambridge to Ferranti in Manchester, and there helped

both the hardware and software people with the multiprocessing, multiaccess and read-only-memory concepts under development.

We became good friends during this period, and the friendship continued when he went back to university life. He was a member and president of the British Computer Society, an adviser and consultant to government agencies, and a very respected international figure. But I remember him best as a man, not as a famous computer expert. I remember his sympathy for younger people, his quiet humor, the little favors he did for me and for many others.

He had friends, admirers, disciples from Australia to Zambia. He influenced the software business strongly for 20 years. He believed in the computer and in what it could do for Britain and for the world. He will be missed.



Herb Gross

Certainly, neither of these specimens really takes into account the needs of the insurance policy holder or the patient although system design could easily do so.

Bob thinks, and I agree with him, that there is one profession that has dumped its problems right in the lap of the public and we are getting a bad name because of our failure to do a little more, and to have a little better system design.

No wonder there is a call for licensing, when we have no way of pulling our own standards up in such basic areas as billing.

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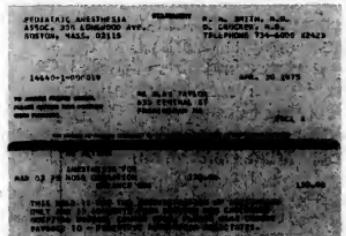


Figure 1. This bill is accompanied by a note inviting you to the doctor — if you have supplied proper insurance information to the doctor — but there is no flag on the bill to say that they have actually filed a claim or that they have all the information to do so. What good is a bill if it is known not to be due? (Or is the service bureau just increasing its business by not suppressing bills of this nature).

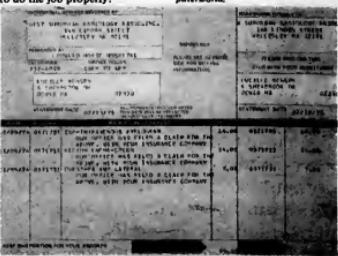


Figure 2. This bill was followed up by computerized "nastygram" letter addressed to the wife of the policy holder. Letter complaints and request for information failed to stop the automated letter series — a waste of postage and irritation all around. Again, no inclusion in the system that the bill should not be sent out as a bill until it is really totally due — and that does not yet appear to be true.

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Letters to the Editor

Sight-Checking Must Bow To Practicalities of Job

In the April 23 Taylor Report, Gerald Salton blamed the system for an undeliverable W-2 form that ended up in a drawer at the post office.

A system is only as good as its weakest link, and it was apparently a clerical function to return W-2s in this particular case. No mention was made of any W-2s that were delivered. If the one W-2 was there, I would say it should not be used as a method to analyze errors.

There was one statement with which I disagree: "The computer system has replaced thinking clerks with unthinking keypunchers."

If keypunchers work in an environment where they handle a variety of jobs, they have to be thinking all the time. True, you can enter a person's last name for a street, but this shouldn't be classified as "unthinking."

If operators were required to sight-check everything they entered, we'd all still be waiting for W-2s.

Ronald A. LaForce

Cleveland, Ohio

Don't Hang Up

In response to the letter from Michael P. Eisenman headlined "Honeywell User Feeling Ignored" (CW, April 23), I would like to present another viewpoint.

We at Carl E. Woodward, Inc. have just signed a five-year lease for Honeywell's newest machine in the 60 series, and by no means are we a large corporation — no more than 200 users on-line.

As a recent graduate in computer science, it has been my duty to provide management with a viable solution to our current DP and accounting problems. The only road to solving these problems is the opening of communications.

Just as I must constantly communicate with my manager to find out exactly what he is looking for in terms of information, Eisenman's DP manager must also communicate with him. To provide this information, I reviewed 16 different computer vendors and selected the Honeywell vendor because of the machine's reliability and because of the response I received from all my inquiries.

Honeywell did not "suck [Eisenman] into an extended lease." He signed the contract. If he feels slighted or ignored, let Honeywell know directly.

If Eisenman hangs up on his end, he is just as much to blame as I am.

Michael R. LeCardeur

DP Manager

Carl E. Woodward, Inc.

New Orleans, La.

Source of the Action

I have been reading Computerworld for six months now in the hopes of seeing some articles relating to small retail business and computer use.

We have two stores and I know there are thousands of others who are in our position. We are looking for ways to make use of cash register point-of-sale computer information for one of our small store operations.

It seems so funny to see the ads in CW for big companies that have all kinds of computer terminals — except those attached to a computer register — and baby, that's where the action is in moving goods and services.

Carl Riecken

Riecken's Shoes

Evansville, Ind.

Superman Not Real

After reading the statements of Kenneth W. Lord Jr., president of the Society of Certified Data Processors (SCDP),

"Lord Defends Licensing as Matter of Conscience," CW, April 23, Lord makes about as much sense as a rubber crutch.

If all Lord is worried about is the consumer's well-being, he should start a consumer group. If he thinks Supermen can be real and there is nobody that can be great in every area of DP (great managers are not always great systems people).

I do not believe in licensing — all it will do is create another data base file of names and addresses. Those in the business that are great will be recognized without a license.

Let's work on educating upper management in DP, since it is creating audit systems for the upper management and auditors to use in place of licenses.

John W. Larson

Sterling, Colo.

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In a recent survey of ninety telecommunication monitors users TASK/MASTER ranked ahead of CICS, ENVIRON/I, and INTERCOMM in ease of installation.

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Not unexpectedly, in a recent user survey nearly two times as many INTERCOMM users and three times as many CICS users said that their company restricted the application programmer as did TASK/MASTER users.

resource management

TASK/MASTER's basic architecture and technical facilities allow significant resource savings. Survey after survey and installation after installation shows that TASK/MASTER can save 10-15% and 10-45% in storage (including real storage required in a virtual environment) for any specific user requirement that can competitive approach.

TASK/MASTER also saves on other system resources, including CPU overhead, disk space, and master terminal costs.

features

TASK/MASTER provides features totally unmatched in any competitor's system. Some of these are:

- complete message queuing mechanism, including automatic disk overflow, station-by-station control, queue protection, and duplicate message suppression in the event of system failure and restart
- true terminal independence which makes device control characteristic transparent to application programs and is far more powerful and flexible than any other message mapping facility
- message protection showing automatic retransmission of messages after system or file loss
- a general interface to any database management system, including TOTAL, DL/I, ADABAS, DBOMP, IDMS and others
- automatic application restart in the event of a system failure without duplicate file updating due to message reprocessing
- terminal support which covers the widest choice of IBM and non-IBM devices in the industry

vendor support

TSI's support for TASK/MASTER users is the best in the industry. Once again using the DATAPRO survey as a reference monitor users rank our support for TASK/MASTER well ahead of CICS, INTERCOMM, and ENVIRON/I.

In an independent user study, approximately 85% of TASK/MASTER users felt that the technical support provided with the package was good versus less than 65% of the INTERCOMM users and only half the CICS users. Why? Possibly because of the four vendors involved, we are committed exclusively to excellence in our systems and have built a Customer Service organization committed to that single goal.

cost

Although the other advantages on this page translate into cost savings many times the price of the monitor itself, TASK/MASTER is also the lowest cost package on an out-of-pocket basis. TASK/MASTER's low price includes all installation support and education services.

performance

Whatever your environment — DOS, DOS/V, OS, or OS/VS — TASK/MASTER will perform better than any alternative you could choose.

Surveys have consistently placed TASK/MASTER at the head of the field in overall system performance considerations. In a VS environment, TASK/MASTER has over two years of demonstrated capabilities running in a fully virtual mode; an unmatched record with equally unmatched results in scores of VS shops.

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In the time analysis of user satisfaction of existing users it is possible that the critical factor in selecting a monitor. In survey after survey TASK/MASTER users have expressed the highest level of satisfaction with their system. DATAPRO's results were once again typical; when asked to rate their monitor as excellent, good, or fair, 85% of the users of TASK/MASTER came out ahead of the field by a significant margin.

In 175 installations around the world, TASK/MASTER is establishing new standards for simplicity of use, reliability, performance, and user acceptance. Any or all of these users are our best advertisement.

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The Hewlett-Packard 3000 is a minicomputer?

**“The 3000 a minicomputer?
I think calling the 3000 a mini is an abomination!”**

When we asked Mr. Thomas Harbron, Director of the Computing Center, Anderson College, Anderson, Indiana, what he thought about the HP 3000, he had some very interesting things to say:

“We’re using the 3000 for administrative processing, academic work and some commercial work. We have 27 terminals and we selected the 3000 because we wanted a system that would provide us with remote access and would do general purpose types of things from the terminals. The 3000 allows us to do many different things at different terminals. In fact, it does everything we expected it to do and was the only machine we could find in its price class that would. I’d recommend the 3000 to others. It’s a powerful and versatile machine. And it’s cost effective as well. It’s half the price of anything that comes close to it.”

“I don’t think that Hewlett-Packard ought to call the 3000 a minicomputer. It is a complete medium-sized system.”

That’s what the EDP center manager of an aircraft manufacturer said about the 3000. He also had this to say:

“One primary reason we bought the 3000 was to collect and analyze radar development data. The problem is that we have to collect data fast enough, pipe it to a computer, analyze it,

and then make the necessary instrument adjustments. HP’s 3000CX was the answer. We also bought it for its interactive capability. Very significantly, in our acoustics department we had to have the ability to turn around data analysis fast. The 3000 has been a real cost saving computer for us. For the last two years I was the entire staff for the 3000. Not a great deal of detailed knowledge of the system is necessary. Technicians can use it without much training. I’m very much sold on the 3000. And it’s definitely a complete system—not a minicomputer.”

**“It allowed us to run eight times the volume at a third the cost.
No minicomputer could do that!”**

The above statement was made by the corporate banking division EDP manager of a major California bank. He also said:

“We’ve had the 3000 for over nine months. A year ago we were on a time-sharing system and the cost became prohibitive. We contacted six different companies to look over and bid on a proposal that defined our needs. HP was the only one that could handle our total application of management information for the Corporate Banking Division. The 3000 is not just a mini—it’s much more. We’re constantly amazed people here with what we can do. It’s not hard to operate, not hard to cope with. But our favorite topic is that we’re paying less than one third of what we were paying and running four times the volume. And this year, we’ll double our volume again. That’s eight times greater and less than one third the cost. That’s really productivity!”

“We found the only thing mini about the 3000 was its price.”

When we asked the EDP center manager of another major manufacturing company about the 3000, that was what he had to say. He also had this to say:

“Our computer needs include both scientific and commercial applications. We were phasing out our teleprocessing terminal and our Environmental Monitoring Division's computer. So we started looking. We spent several months studying computer systems, and rated them on speed, versatility and ease of operation. The result of our study showed that the HP 3000 provided these requirements and had the best cost/performance ratio. We didn't fully realize the potential of the 3000 until we started programming it. We have experienced a significant cost savings in the seven months we've had the 3000 and we expect a greater savings in the months ahead. We really like the interactive CRT for programming and data input. Being a multi-programming system we can have many users on at the same time. The power and speed of the 3000 is equal to a large machine. It's no mini. Calling it the Mini DataCenter is more accurate. I'd definitely recommend the 3000 to other potential users. In fact, we already have. We feel they would be money ahead.”

We're glad these and other users of the HP 3000CX set us straight. We called it a mini-computer because its state-of-the-art technology lets us sell it for a minicomputer price. From now on we'll call it a Mini DataCenter.

We want you to get the whole story. Write us for your copy of our HP 3000CX Mini DataCenter booklet. We know you'll find it interesting, informative, and maybe a bit surprising.

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Letters to the Editor

Bug-Free Applications Only 'Incredible Self-Deception'

Although *Computerworld* gave front-page prominence to the story about microprocessors and "grand scale integration" ("Microprocessor Revolution Seen Altering Traditional DP Center," CW, April 16), it is difficult to believe that the author or the author of the story can be aware of the state of the art of programming.

To judge from the behavior of the people who use the computer in my Computing Services Center, as well as the remarks made by my own programming staff, even a writing of 20 lines of bug-free code is regarded as a miracle.

Nearly everything these people do is counterproductive, that is, it hinders their ability to produce bug-free code.

To imagine the advent of another "admirable" hardware technology portends the arrival of an ability to produce bug-free application programs is the most incredible kind of self-delusion I have encountered in recent years.

Robert M. Gordon

Computing Services Center
Victoria University of Wellington
Wellington, New Zealand

Ordinance With an Impact

I was interested to read the April 2 editorial praising the Association of Data Processing Service Organizations' (Adpso) proposal for requiring a privacy impact statement before any new government data system is implemented.

The city of Berkeley has just such a law

(Ordinance 4732-NS). It requires that, before any money is spent beyond the preliminary design stage on a city-run system which includes data on identifiable individuals, a series of statements must be prepared and adopted.

It is my hope that this ordinance will serve as a model, or at least a stimulus, to similar legislation at the local, state and federal level. Anyone who wants a copy of the ordinance can obtain it without charge from the office of the city clerk.

Ronald K. Shepherd

Berkeley, Calif.

No Such Suggestion

In the article by Gordon D. Hutchison which appeared in the March 19 issue, the author reported that "the Canadian computer industry is sufficiently opposed to a new set of terms issued by the federal government that they may collectively refuse to sell to the government."

The Canadian Equipment Manufacturers Association (Cema) has been discussing standard terms and conditions with the Department of Supply and Services since early 1972.

While Cema objected to several of the terms included in that document, there has been no suggestion the members of Cema would refuse to sell to the government upon those terms.

The members of our association are individually dealing with each procurement. In the meantime, our association is continuing to make representations to the government concerning those aspects of DSS 9020-A which are objected to.

G.D. Wynd

General Manager

Cema
Rexdale, Ontario

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CW514

SOFTWARE & SERVICES

"With a Little Help From..."

TVA Tunes 360/50 Operations, Then Goes to RJE 30

By Don Leavitt
Of the CW Staff

CHATTANOOGA, Tenn. — The systems programming staff of the Tennessee Valley Authority (TVA) has spent the past two years becoming aware of the potential value of computer performance evaluation (CPE) and applying some CPE techniques — with impressive results.

"But we haven't gotten too far down the road yet," according to staff manager Kathryn K. Hicks.

"Do we do the 'tune' or not," Hicks' crew has learned to keep its eyes and ears open "at all sorts of evaluation meetings." Though she wasn't able to dedicate one of her staff to CPE, Hicks has followed a pragmatic approach — "Let's outline a plan and see what we can do with what we've got."

One of the things she does have is a good working relationship with the Federal DP Evaluation and Simulation Center (Fesdin), which was called in two years ago to study the TVA situation. The authority had just recently installed an IBM 370/165, but had most of its workload on a 370/36.

Hicks didn't think the 50 was saturated, but she "had a feeling it wasn't doing what we ought to be doing. We just weren't getting out of it what we ought to have gotten."

And so Fesdin was asked to study the 50, suggest changes and help TVA to become self-sufficient with CPE.

For example, Dan Deese, who made the original study, including a month of hardware monitoring and analysis, but as he noted recently, TVA was already doing things to help itself. Some of the workload was being shifted to the 165 and so the 50 was freed up.

But the study highlighted some areas of concern, and Hicks and Deese went to work on them. There was a good indication, for example, that the 50 wasn't maintaining a satisfactory level of multiprogramming even though it was under OS/MVT.

The 50 also began to recognize user organizations that were having an especially heavy impact on the system resources, and they used some of their software tools to see if those programs couldn't be made more efficient.

Disks Ill-Used

The study also showed disks were not being used effectively. For the most part, they were organized into sequential files and being used as if they were the tape drives with which the applications programmers were familiar.

Deese suggested additional training for the operators so they would have a better understanding of the possibilities of OS/MVT multiprogramming. Use of

IBM 2314 disk drives and more modern access methods helped in the peripherals area, and reworking the Job Control Language (JCL) or some programs also improved their performance.

In one case, Deese recalled, a two-card JCL change meant an annual savings to the end user of \$50,000 in computer time.

In any event, the overall impact of all the first efforts was a cutback in the schedule on the 50 from three shifts on Sunday to a week to two shifts on five days a week.

Since then, the shift of work to the 165, located here, has continued and the 50, once in Knoxville, has been completely

replaced by a 360/30 being used as a remote job entry (RJE) workstation feeding into the 165.

Some of the 11 disk drives originally bought for the 50 are still in TVA service, but they're now dedicated to the 165, enhancing the resources available to that system, Hicks noted.

Fesdin and TVA have continued an informal exchange — "mostly letters and phone calls" — since the original study was completed, and Hicks feels her staff has "a good level of expertise" in CPE work that she set as a goal in one of her letters to Deese.

But the 165 is beginning to show the results of some of the tuning and some of

the inevitable growth in workload that comes to any large system. TVA is getting deeply involved in time-sharing, with 10 terminals now running under IBM's Time-Sharing Option (TSO) and another 20 expected by the end of the year.

The RJE work from the 30 in Knoxville and implementation of a data base management system planned later this year, will take their toll, too. So, in September, Fesdin will be invited back to TVA to study the situation on a more formal basis, to see if it can spot any bottlenecks the local staff has overlooked.

Such a periodic audit ("That's too harsh a word; I'd prefer review," said Deese) will be a continuing part of the Fesdin-TVA relationship. "We've always thought it would be good to have an audit by an outside group, to keep us honest in our own evaluations," Hicks explained.

But the Fesdin-TVA combination is a symbiotic one. Though Deese has found various software tools that Hicks has put together, he has also developed some of his own, something that Deese's suggestion, when Fesdin has then taken it into its own inventory for distribution to other government agencies.

With an obvious mix of pride in what she has accomplished with her five-man team and a realistic recognition of what still might be done, Deese ticks off a list of 10 or more programs — "mostly home-built" — that she has and would be willing to share with almost any other installation.

Built for Educational Manager, Package Suits Business Needs

TORONTO — Developed for educational planning and management systems, Campus PMS from Systems Dimensions Ltd. (SDL) appears to be potentially useful in more conventional business situations as well.

The package consists of five integrated components designed to aid in the assembly and evaluation of information about a number of interrelated activities.

As many as 2,000 activities, grouped in 500 categories, 10 major administrative units and — in its academic application — from 300 to 10,000 students, are supported by the system, SDL said.

Written in Fortran and Cobol, the Campus subsystems can be used on a variety of CPUs and integrated with practically any other system. It can read prepocessor subsystem edits data from other systems or files and creates input for the other Campus components.

The core analysis subsystem allocates resources according to user-controlled rules to arrive at activity costs.

In its academic implementation, the operation maintains student displays, faculty mix, faculty workload and space utilization, and it provides data for the resource planning subsystem.

The fourth subsystem, for resource planning, is a modeling capability allowing users to simulate administrative structures — academic or commercial — to explore "what-if" situations and come up with specific, detailed answers, SDL said.

Finally, the budget reviewer subsystem provides a means of itemizing budgets, consistent with future plans. The basic problem that blocks immediate use of Campus PMS in nonacademic situations is a relatively minor one, the vendor noted, involving inappropriate titles on the system.

Campus PMS can be run on IBM 360/40 and larger CPUs in the 360 or 370 series, on Digital Equipment Corp. Decs. Decs. 10-15, Burroughs B5700s and Xerox Xmas 6s. It utilizes about 100K bytes of IBM's OS.

The system can be acquired for \$5,000 including source code, test data, documentation and two days of vendor support. It is being marketed by the Educational Services Dept. of SDL at 111 Avenue Road, here in Toronto, M5R 3J8.

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Utilities Adapted to DOS/VS

LYONS, Ill. — Packages originally developed to enhance DOS/360 installations are gradually being converted to DOS/VS as well. Examples of the trend are three products from General Electronics.

The Job Control System Editor allows the user to develop and then store on disk whole series of Job Control Language (JCL) statements, thereby avoiding the hazards of trying to maintain JCL cards. The version of this procedure library supports DOS/VS for DOS/360 and DOS/VS for \$350.

The Device Assignment Controller frees the user of the DOS logic limiting assignment of disk and tape devices to specific partitions.

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ELS Builds Mini DBMS

FAST CLEVELAND, Ohio — A data base management system (DBMS) "highly oriented toward Cobol specifications." Product 3 is designed for users of Digital Equipment Corp. PDP-11s but is available for installation on Modular Computer Systems (Modcomp) and some Interdata minis as well, according to the vendor, ELS Systems Engineering.

The DBMS supports real-time functions such as process control and on-line inquiry and update.

The basic module includes three access methods and facilities for creation of records, allocation of disk space for the data base and recovery in case of hard or soft failure. The access methods are, in effect, primitives from which users can build a variety of data base structures, the company added.

The system provides an indexed sequential method ("radically different

from IBM's Isam, though the differences are transparent to the user"), relative addressing or direct access ("just because some minis don't provide it"), and multilist chain sequential access.

Product 3 has no self-contained inquiry language but the DBMS logic can be accessed from "any conventional language." Application files are created through a central menu and may be used and maintained independent of Product 3 when that approach seems appropriate.

The system is compatible with DEC software running under DOS, RSK-11/110 or the RSTS/E supervisor and is superimposed on their basic I/O functions.

Product 3 costs \$7,500 plus installation. ELS can be reached through P.O. Box 24115, 44112.

Multilingual Multiprogramming Aided by HP 21MX-Based RTE-III

PALO ALTO, Calif. — Hewlett-Packard (HP) 21MX minis can be transformed into multiprogram, multilingual machines with I/O selection, multiterminal monitoring capabilities with the RTE-III disk-based real-time executive just introduced by the mini vendor.

As many as 64 multiuser partitions can be defined for simultaneous use, ranging from program development chores through execution of existing program and application software. High-level languages available include Fortran IV, Algol and a real-time Basic.

Program execution may be scheduled by time, events or operator command. The system includes a management routine for access to random or sequential files, and disk storage, starting with 56 bytes, HP can be expanded to 118M bytes, HP

noted.

With RTE-III, individual units in a terminal network may be used for specific types of tasks regardless of what other units may be doing.

Multitasking batch processing is possible, providing job control over program development and other background operations. Optional distributed multiprocessing software allows real-time program scheduling and file management functions from a remote satellite CPU, HP said.

RTE-III can support a variety of peripherals including magnetic tapes, line printers, card readers, plotters and analog and digital I/O interfaces. System software provides power-fail restart.

U.S. price for the RTE-III software to end users will be under \$7,000. Systems houses can obtain the executive for a licensing fee, and high-level language charged end users, and these houses may then copy the software once for every system sold at no additional cost, HP said.

Macro Use Enhanced On Interdata Minis

OCEANPORT, N.J. — Alternate macro libraries and keyword macro prototypes are among the features of Macro Cal language processor now available to users of Interdata Corp.'s 7/32 and 8/32 as well as its 16-bit minicomputers, the vendor said recently.

At the same time, the company also introduced Basic/32, which includes an interpreted package of supporting standard Dartmouth Basic and a range of extensions, for use on Interdata 7/32s and 8/32s in multuser, terminal-oriented environments.

The ability to use alternate macro libraries allows each programmer under Macro Cal to have his own library of macros tailored to his programs and applications.

At the individual macro level, keyword prototypes make it possible to use symbolic references in the macro routine to arguments or variables in the macro's parameter list.

The Basic/32 package's extensions include matrix handling, string data manipulation and pattern matching. The package's standard features encompass run-time trace facilities with user-controlled SET TRACE and END TRACE commands, matrix operations, an extended integer data type and INPUT and PRINT via logical unit.

Basic/32 is resident under OS-32/MT, is resident in 10K bytes of mainframe memory and sells for \$150. The Macro Cal package requires 24K bytes of memory and sells for \$300. Interdata added from 2 Crescent Place, 07757.

RSX Software Adapted To Smaller DEC PDP-11s

MAYNARD, Mass. — The RSX-11 line of real-time software from Digital Equipment Corp. has been extended with the introduction of RSX-11S to run on small PDP-11s.

A core-resident system, RSX-11S is a subset of RSX-11M and is particularly suitable for use in "harsh environments" where a diskless minicomputer system could create problems in reliability, according to DEC.

Programs for RSX-11S use must be developed on a host PDP-11 operating under RSX-11M, Version 2, introduced along with RSX-11S.

The small RSX-11S is licensed at \$1,200 with full software support or \$600 without the support and will be ready in early fall, DEC noted.

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You see, IBM (we almost feel like we should call you "sir") Applied Digital Data Systems (that's us) now has a terminal for IBM users. Wait'll you see it.

It's called the 980A. And, it's packed with the features that helped ADDSS carve a reputation in the Teletype® compatible market. Sharp, readable screen with upper and lower case character display. Line as well as character insert/delete. Not to mention blinking, formatting, and patented graphics.

Compatibility?

The 980A looks just like a 3270 to the telecommunications access method (BTAM, TCAM, etc.) and to such real time monitors as CICS. It can even operate on the same phone line as 3270's.

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applications software developed to support the 3270 won't support our 980A. So we don't think we'll be replacing many of your 3270's.

But, the IBM user can develop new applications around the 980A. And the reason we think he should (here's where you get nervous again) is quite simple. The 980A offers unmatched features at an extremely low cost. Namely, \$3200.00 to purchase, \$90.00* a month to lease.

And all of our units are serviced by NCR.

That's pretty much why we think if our shoe fits, the IBM user's going to wear it.

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DBMS Features Told

WELLESLEY, Mass. — Users can now acquire separate technical reports on the specific data base management systems (DBMS) contained in the 1975 edition of QED's "Information Sciences: Data Base Management Systems: A Critical and Comparative Analysis."

Developed jointly by QED and Performance Development Corp., each report provides an "intensive description and analysis" of the system it covers: IMS/VS, Total, Adabas, System 2000 or IDMS. A spokesman said.

Each report also contains an in-depth explanation of the criteria used to analyze and evaluate DBMS in general. The same criteria were used to compare the systems with each other in the more comprehensive publication.

The individual reports can be purchased for \$60 each from QED at P.O. Box 181, 02181.

Commitment Needed, But . . .

Many Utility Packages Too Good Not to Use

By Nancy French

Of the CW Staff

CLEVELAND — Some utility software packages the market are so good it might cost a user more than he thinks not to use them, Gaylord Smith, manager of computer control systems for Nationwide Insurance Co., told Computer Caravan attendees here recently.

It's easy to select a package which ends up costing on the shelf because it either doesn't solve the user's problem or is too time-consuming to use, he said.

To convince himself as well as his management that what the user is suggesting is really the right choice, he should write a formal proposal including such things as cost; anticipated savings in time, dollars and personnel; advantages; and alternatives, Smith said.

Then carefully evaluate the vendors,

keeping in mind "size does not imply quality." A software house whose sole livelihood depends on its software packages is going to be more sensitive to user needs than the large equipment manufacturer."

Finally, he said, the user should make sure he has personnel on his staff to support the package once it's installed. "Unless it's completely turnkey, and few are, somebody is going to have to spend time on it," he said. "And if the package is relegated to someone's spare time, it will never work," he added.

Among the packages Smith expressed mixed feelings about were flowcharters, Cobol shorthand and the data dictionary. Flowcharting packages such as Autoflow from Applied Data Research, Smith said they found them to be of little use, explaining "we're not really flow-

chart-oriented at Nationwide.

"Particularly if you're programming in Cobol, you're much more likely to go to the source code than any flowchart," he said.

The flowchart with its requirement for large amounts of machine time and paper tends to make such packages somewhat less practical today, according to Smith.

On the subject of Cobol shorthand, Smith expressed doubts about having decided against using it.

"We're looking at that again," he said. "It saves wear and tear on coders' wrists and keypunch operators."

Smith agreed with one attendee who pointed out that Cobol shorthand encouraged programmers to use good data names since they can write them once and then code in a four-letter abbreviation all the rest of the way.

The data dictionary, designed to keep track of data names, is another tough area, Smith said.

"I'm not convinced that it's not a solution to a search of a problem," he said. "I've yet to see a guy come out and say 'I want to see those files' or anyone use the report for its own value. You must have manpower to work on these."

As for source maintenance packages, Smith said he didn't know how Nationwide would function without Panvalet from Panoponic Systems.

"A program analyzer shows where you can change a program to reduce the number of instructions and make it run faster," he said. But based on Nationwide's experience with Strobe from Programmat Corp., Smith indicated a need for support from top management to get programmers to use some packages.

In the area of the Cobol post compiler, Nationwide evaluated several and found the Cxplex Optimizer to be the best, he said. A package that identifies inefficient code and generates better code, Optimizer can save the user both core and CPU time by eliminating low msec instructions, Smith said.

Nationwide went to Syncsort III from Whitow Computer Systems, Inc. after continually running out of disk space with IBM's SM-i Sort, Smith said.

No Secondary Sort

"SM-i had no secondary sort," he said. "Sometimes we were using 200 cylinders when we should have been using 30 or 40," he explained.

The new sort package not only provided that secondary sort capability but also saved 7% on CPU time and improved elapsed time by as much as 10% to 20%, he said.

Two good sources of information on utility packages, Smith said, are the *ICP Quarterly* and the *ICP Software Newsletter*.

Correction

In the article, "'Do It Yourself' Bad Advice for Utility Packages" [CW, April 23], Applied Data Research, Inc. was incorrectly referred to as Advanced Data Research.

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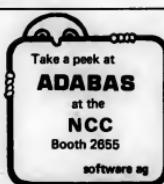
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COMMUNICATIONS

Ties Operating Systems Into Nets

DEC Software to Provide Distributed Processing Basis

By Ronald A. Frank

Of the CW Staff

MAYNARD, Mass. — Digital Equipment Corp. has introduced a communications software framework with which it plans to implement distributed processing techniques.

Called Decnet, the communications software can tie together previously available DEC operating systems into integrated networks. The software includes three protocols which DEC calls Digital Network Architecture and appears to be the second stage in IBM's System Network Architecture.

The first protocol, known as Digital Data Communications Message Protocol (DDCMP), was previously available from

DEC. It operates over full- and half-duplex facilities with synchronous, asynchronous and parallel facilities.

The second protocol, the Network Services Protocol, was designed to handle the routing of messages between systems or within systems. The last is called Data Access Protocol (DAP) and is said to enable programs on one node of a network to utilize the I/O services of other nodes.

By adding the Decnet capability to existing operating systems, users can implement hierarchical, distributed, resource-sharing and communications networks, DEC said.

In order to accomplish these goals, the customer is required to add the Decnet

software as an enhancement to previously announced operating systems.

These include RTS-8 for the PDP-8; RTX-1, RSX-11S, RSX-11M, RSX-11D, RSTS/E and IAS for the PDP-11; XVM/DOS and XVM/RSX for the PDP-15; and the Top-10 system for the Decsystem-10.

Decnet implementations have been priced for the first three systems, which are scheduled to be available in September. The Decnet software on the RSX-11S will cost \$1,000; on the RSX-11M, \$1,500; and on the RSX-11D, \$2,500.

Availability for the other operating

synchronization and modem operation for the transmission of data bits over a physical link.

Decnet is said to simplify intercommunications between processors by providing three categories of network commands. The first, or Basic commands, create communications paths and pass data between nodes.

The second, or File-Sharing commands, allow one CPU to transfer data or request data from a file or I/O device that is part of another CPU system.

The third commands are called Program Control commands and allow one CPU to start and stop the execution of programs

DNA = Three Protocols

MAYNARD, Mass. — Digital Equipment Corp. has added two protocols to its earliest Digital Data Communications Message Protocol (DDCMP) (CW, Dec. 11).

They are known as Network Services Protocol (NSP) and Data Access Protocol (DAP). Together the three protocols make up what DEC calls Data Network Architecture (DNA).

NSP provides the capability to route messages between systems or within systems. The protocol makes it possible for two programs on different machines to establish a logical communication channel and to exchange data.

DDCM allows the dynamic creation of logical links between tasks and can exchange data between tasks on either a solicited or non-solicited basis (through interrupts).

systems ranges from "late 1975 to late 1976," a spokesman said.

Decnet is said as having four levels. The dialog level converts messages sent over a logical link into a "meaningful exchange between users." The logical link level controls the multiplexing/demultiplexing of the message stream to create complete messages in proper order.

This level also is responsible for acknowledgement, message segmenting and routing.

Physical Link Level

The third or physical link level of Decnet, which serves as the interface for messages to and from the hardware level, is concerned with message error detection and recovery, message sequencing and message synchronization over the physical links. The hardware level is concerned with transmission techniques, character

and bit timing. It also allows for the route-through of messages traffic within the network, permitting two nodes to communicate via a third node. Dynamic management of network topology is allowed, and each node is kept informed of the status of other nodes and links in the net.

DAP enables programs on one node of the network to utilize the I/O services of other network nodes. It includes standard file access from sequential and random files and remote device access for unit record devices.

DAP provides for virtual terminal support which allows an interactive terminal physically connected to one system to operate as though it were connected to another system in the network.

DEC has said it will provide specifications for DDCMP, NSP and DAP free on request.

on other systems in the network.

Remote Devices

Using the Decnet software, users can control a device at a remote location as if the device were local. This allows satellite systems that have access to all system resources to be created. Terminals on one system that have access to another system through peripherals can be shared among several systems.

It will also be possible to access remote files as if they were part of a local system. And program sharing will allow "loadable programs" to be sent to another system for loading and execution.

In addition, it will be possible to open a data path between programs on an interactive basis. This will allow large tasks to be divided and distributed into smaller units to be executed on different systems in the network, DEC said.

DG Programmable Multiplexers Form Communications Subsystem

SOUTHBORO, Mass. — A subsystem of programmable communications components has been introduced by Data General Corp. (DG). It allows DG systems to be configured across varied data communications applications — from small remote terminal systems to high-performance dedicated communication processors.

The subsystem components include synchronous and asynchronous multiplexers, the ALM-16, ALM-8 and SLM-2, for low-level transaction rates, and a data control unit, the DCU/50.

The DCU/50 provides high-level data communications throughput with low central processing overhead. It includes software for line control and user interface. These components can be implemented singly or in a variety of combinations for low- or high-level operation and can be easily expanded without altering their software, the company said.

The programmable multiplexers may be used with any DG CPU. The ALM-16 is a 16-line asynchronous multiplexer; the ALM-8 is an eight-line asynchronous multiplexer with full modem control; and the SLM-2 is a two-line synchronous multiplexer.

Any of these may be interfaced to the I/O bus of a DG Nova or Eclipse computer or to the DCU/50.

User Programmable

The DCU/50 is a user-programmable communications controller that performs character processing and line protocol functions in parallel with a central processor or a dedicated communication processor.

Designed for use with a DG processor, it contains a 2K-byte random-access bipolar memory, 600 nsec instruction speed for add and move, and a 300 nsec speed for load and store instructions.

One DCU/50 permits communications throughput of up to 48 kchar/sec; additional DCU/50s can be added to achieve even higher throughput with low processor overhead, DG said. The unit interfaces with the DG-10, DG-15, DG-16, DG Direct Memory Access (DMA) channel.

In systems with low transaction rates, any of the multiplexers can be interfaced directly to the CPU at very low cost, the company noted. As data communications traffic and systems overhead increases, a user can add the DCU/50 by interfacing it between the multiplexers and host processor.

Supports Multiple Protocols

One DCU/50 can support multiple protocols with up to 256 mixed synchronous and asynchronous lines through the ALM and SLM multiplexers. An Eclipse or Nova processor may contain multiple DCU/50s for heavy data communications traffic.

Price of one DCU/50, which occupies one card slot in the host chassis, is \$3,000; the ALM-16 costs for \$2,640; options add \$2,000; and the SLM-2 is \$1,940.

A basic data communications subsystem consisting of a DCU/50 with its software, an ALM-16, an SLM-2, data communications chassis and cabling is priced at \$8,940.

The data communications subsystem will be ready for shipment this fall.

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On May 19, 1975, Diablo is introducing four significant new products at the National Computer Conference in Anaheim.

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MCI Adds Management Functions for Private Line Nets

By Ronald A. Frank
Of the CW Staff

NEW YORK — MCI Communications Corp. will soon add computerized traffic monitoring, call routing and other telecommunications network management functions to its private line service.

The additional services will provide users with capabilities that previously could be implemented only through the installation of in-house equipment. Three services called Telemangement, Telanalysis and Switched Private Line Service have been announced by the specialized carrier.

Telemangement is described as a combination consulting and computer service which will manage and control intercity communications facilities for the user. This will include connecting the customer's lines to a computerized switch at an MCI terminal location.

The customer will make all calls in the normal manner and the computer will assure that all calls are made through the least-cost facility available at the moment the call is initiated, consistent with the individual caller's priority access level, MCI said.

Among a variety of other features, the user will receive detailed cost-allocation reports at the end of each month.

The second facet of this service was designed for customers who already have large private telecommunications networks and seek the capability to access those networks from noncompany locations. This service will allow a customer to access his private network, on a least-cost routing basis and without operator assistance, from any of the 29 cities served by the MCI network.

Management reports, identifying the users and the numbers called, will be provided each month.

Complete Statistics

No MCI equipment will be installed on the user's premises and complete statistics will be provided in hard copy or magnetic tape format at the end of each month.

As part of the service MCI will provide least-cost routing of calls, identification of calls according to calling party, department to be charged and other required data. The minimum commitment is for 30 days and cost of the service is estimated at 5% of the user's current intercity telecommunications costs.

To implement the Telemangement service, MCI plans to install a Collins switch or similar equipment.

A typical Telemangement service to monitor 70 trunk lines would cost about \$20,000 on a 30-day basis or about

MCS Adds Workstations

For Hazeline 2000s

ELMSFORD, N.Y. — MCS Design, Inc. has a new group of workstations designed for the Hazeline 2000 series of CRT terminals.

The CRT workstations are available for \$200 with a single top and \$250 with two. The firm is at 525 Executive Blvd., 10523.

\$109,000/year, an MCI spokesman said. Local lines for connection to MCI monitoring facilities would be extra.

Circuit Analysis

Telanalysis is a combination consulting and statistical recording service which analyzes a user's utilization of his communications facilities and operating performance of the circuits. It will be available to analyze circuits from MCI and/or other carriers.

Users will be provided with

traffic figures as well as information for later network reconfiguration. Typical cost will be \$3/mo per circuit analyzed. The service will begin in July.

The first equipment to be installed for Telanalysis will probably be a traffic data analyzer from ESE Electronic Systems, Inc., which will be interfaced to a Digital Equipment Corp. PDP-11 processor at the MCI terminal office in Detroit, in mid-1975.

The ESE analyzer will be connected using modems to scan-

ners which monitor private lines at the customer's site, an MCI spokesman explained.

Features of this service will include off-network to on-network access, call forwarding, speed dialing using three digits, etc.

All features of Telemangement and Telanalysis will be included.

This service will begin in 1976 and pricing will be based on the user's optimized point-to-point requirements, the company said. Pricing for all three of the services will depend on exact user needs.

Like Bell's CCSA

The third service planned by MCI is switched private line capability similar to Bell's Com-

NETWORK

**MAXNET CLEARS
THE PICTURE.**



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IBM 3611 Model 2

For Passbooks, Checks

IBM 3600 Bank System Gets Printer

WHITE PLAINS, N.Y. — IBM has introduced a banking terminal table-top printer that records bank transaction data on passbooks, checks and a variety of other single or multipart documents.

The IBM 3611 Model 2 passbook printer is one of several printers available with IBM's 3600 finance communication system. It prints 12 char./in. and can operate at speeds of 15 char./sec with a 64-character set

or up to 30 char./sec with a 96-character set.

Users can stack an IBM 3604 keyboard display terminal on top of the printer to create a two-year contract period, or under the IBM standard rental agreement. Depending on features selected, monthly rental ranges from \$117 to \$127 under ETP and from \$138 to \$150 under the standard plan.

Purchase prices range from

\$4,676 to \$5,127, with first

shipments in the '76 first quarter. Transaction, IBM said.

The Model 2 is available under IBM's Extended Term Plan (ETP), which provides for a two-year contract period, or under the IBM standard rental agreement. Depending on features selected, monthly rental ranges from \$117 to \$127 under ETP and from \$138 to \$150 under the standard plan.

Purchase prices range from

Terminal Transactions

NCR Software Verifies Credit

DAYTON, Ohio — An on-line retail credit communications software system has been introduced by NCR Corp.

The package is said to provide credit approval and direct control over credit authorization and delinquent-account collections, both of which are critical expenses in retailing.

The system uses either NCR 260 small terminals or NCR 285 credit pads for data input. With the 280 terminal, no additional equipment is needed at the point of service for positive credit authorization.

NCR 260 general-purpose terminals can be employed in stores and credit offices for other message transmissions and file inquiries. NCR visual display terminals are used for on-line file inquiry, depending on a store's requirements. The various terminals are supported by an NCR 725 minicomputer linked to an NCR Century 101 or larger Centurion computer.

A variety of other features are included:

- If a needed, messages concerning lost or stolen credit cards or bad-check account numbers are sent to a particular store's security office.

- If either the number or dollar amount of a customer's checks cashed during a five-day period exceed a preset limit, the system notifies store management.

- The broadcast and communications feature includes special reports on price charges, markups and markdowns plus the prior day's sales and register reports and allows any store terminal to send a message to any or all other store terminals.

- Flash sales reports showing sales by department can be sent to any store's general-purpose terminal.

- The basic software package, which provides credit authorization, rents for \$200/mo. The purchase price is \$10,000.

Four optional modules are available: broadcast and communications, which rents for \$25/mo and has a purchase price of \$1,200; on-line flash sales totals, \$50/mo or \$2,500 purchase price; delinquent-account collection system, \$100/mo or \$5,000 purchase price; and alpha lookup system, \$25/mo or \$1,250 purchase price.

CTS Execuport Prices Cut as Much as 20%

PARAMUS, N.J. — Computer Transceiver Systems, Inc. (CTS), has announced price reductions for its Execuport line of portable computer terminals.

Cuts up to 20% have been made on prices of all Execuport Model 300 portable terminals.

Four Execuport models were reduced with one version being cut \$805, while the smallest drop was \$315. The reductions include the Model 311, 311C, 320 and 320C.

MODCOMP
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Data Communications

Course # 1010 —

Practical Data Communications Systems and Concepts

This course will give you the information you need to master the newest developments in Data Communications. Led by nationally recognized experts in the field, comment. Dr. Dixon Doll, the course covers major hardware in areas of SDLC, HDLC, relay, and other major revisions to WATS, and the impact of satellite carriers. This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is \$350. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule is as follows:

Chicago — Jun. 2-3
Orlando — Jul. 2-3

Washington, D. C. — Jun. 9-10

Course # 1020 —

Practical Teleprocessing Systems Analysis and Design

This course is built up to Course # 1010, with special emphasis on problem solving techniques for minimizing operating costs in commercial data communications networks. Also led by Dr. Dixon Doll, the course covers procedures, approaches and algorithms for evaluating and cost optimizing network organizations.

This seminar runs three days, and total cost, including an extensive set of customized course materials, luncheons and continental breakfasts is \$450. Additional registrants from the same company qualify for a reduced rate of \$400. Current schedule is as follows:

Los Angeles — Jun. 16-18

Last day for enrollment is May 16th.

Legal Tools for Computer Contracting & Protection

A seminar that gives you the legal tools you need for effective negotiations, agreement drafting, warranties, security, tax planning and software protection.

The impact of the law is felt in virtually every aspect of the computer industry, and you need to know how to apply the legal rules in a positive way to increase your advantage in dealing with vendors that support your installations. This course teaches you how to defend your interests in court and in negotiations with your vendors.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author, educator and expert in the field of Computer Law, you'll learn how to protect your interests in subject areas like these: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, as well as Techniques in handling any transaction. And practical discussion and review of your own contracts is an added benefit of this seminar.

You should attend this seminar if you are an Executive in charge of the use of computers or computer services—whether as a Corporate Executive, DPM Manager, Contract Administrator, Consultant, Inside Counsel, or as a Private Practitioner involved with clients who use computers. Cost for the entire 2½ day seminar, including continental breakfasts, luncheons, and complete resource materials is \$325. Additional registrants from the same company are charged only \$275. Current Schedule:

New York

St. Moritz

June 4-6

Data Base Design

A practical approach to the design, implementation, and maintenance of data base systems

Effective data base system design requires both a complete knowledge of the facilities provided by a data base package, and a basic understanding of the mechanisms which can be employed to construct data base systems. In fact, the former is of questionable value without the latter. This course is a package, independent examination of the techniques required for the design of effective data base systems. The topics covered include:

- Efficient Planning
- Physical Storage Techniques
- Optimum File Organization and Indexing Techniques
- File Integration
- and much more

Guest speakers include: Leo J. Cohen and Performance Development Corporation. This course reinforces the lecture material with workshops, in which attendees apply the techniques learned to practical problems.

You should attend this seminar if you are (or will be) involved in the design and/or implementation of a data base system and whether as a Data Base Designer, Planner or Analyst.

This course runs for 3 days and costs \$350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule

New York The Plaza

June 2-4

Key-to-Storage Systems

How to evaluate and optimize the various successors to keypunch equipment.

Data entry is a big problem—and a big headache—as every computer user knows. It is therefore a prime target for cost savings. This course is designed to help you in the practical aspects of data entry systems, and making the best use of keyboard-to-storage systems. It is an expansion and update of our successful key disk seminar. Under discussion (including some user case studies) will be:

- Introduction to data entry concepts (keypunch, buffered keypunch, keypunch, key disk and beyond...)
- Key disk hardware and software
- Evaluating and starting key disk systems
- Selecting and operating intelligent terminals, both key-to-cassette and key-to-floppy disk
- Key disk as a remote batch terminal
- Supervisor functions: motivation
- Mixed Media systems
- Trends in Computer Data Entry

This seminar is lead by Lawrence Feidelman, President of Management Information Corporations, and one of America's leading experts on data entry systems. The seminar is part of "Data Entry Update," Management Information Corporation's authoritative publication on every aspect of data entry, including a six-month update of this continuing reference service. You should attend this seminar if you are concerned with optimization of your data entry shop, and especially if you are considering or currently using key-to-storage systems more advanced than basic keypunch. Cost for the 3-day seminar is \$350, including continental breakfasts, luncheons, and all course materials. Additional registrants from the same company are charged only \$300.

Chicago

Hyatt Regency O'Hare

June 9-11

To: Ed Bride, Vice President, Editorial Services, Computerworld
797 Washington Street, Newton, Mass. 02160

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COMPUTERWORLD

Bank Tellers' Use of CRTs Brings Shorter Client Transaction Time

NEW YORK—In metropolitan New York City, mutual savings banks create new customer services through the application of terminal equipment.

And Robert R. Maller, executive vice-president at Central Savings Bank said the use of bank automation equipment is not exclusive to the use of massive computer facilities, but rather, a cost-effective terminal equipment at which retailers would point-of-sale. Bank tellers should operate in a similar point-of-sale environment, he added.

Teller workstations at Central Savings will be designed as integral units with each teller operating his own terminal, printing on CRT.

Tellers work on a one-to-one basis with customers, Maller said. "We avoided the typical bank physical arrangement of equipment where tellers move from their workstation to terminals that are shared with other tellers. This can result in a loss of time for tellers and inconvenience for customers waiting for service," he explained.

At Central Savings, tellers individually process deposits, withdrawals and checks cashed and will soon process installment and mortgage payments—all on an on-line, real-time basis.

At the bank's branches and four of Central's offices, tellers business starts with peak lunchtime and payday periods—"we want to get customers in and out of the office as rapidly as possible." Customers equate time directly with good customer service, Maller noted.

Processing Time

One goal was to reduce customer processing time to less than a minute. The bank achieved this goal as a result of terminal systems made by Datasab Systems.

The changeover to Datasab began in June 1973. Since completion, the average process time per customer has been reduced from 88 to 37 seconds, Maller reported.

An objective behind the installation of terminal equipment, Maller said, was an increase in teller productivity. High teller turnover is common in banking, and one way to reduce the problem is to upgrade skills.

Instead of reacting unfavorably to the individualized terminal system that reduces social relations among tellers, tellers enjoy their new status within a highly automated workstation. It also gives them "increased human relations with customers," he said.

Tellers operate a 58-key alphanumeric keyboard, printer for passbook and vouchers, fixed printers for audit trail and tally roll (which provides tapes for internal and customer usage) and a 5-in. CRT. Central Savings, which has 10 branches of other savings banks here, processes its accounts through a jointly owned, on-line data center, Institutional Group Information Corp., which operates dual Burroughs B6700 computers capable of handling 10 million accounts for its member banks.

The link between the terminals and the central computer is a Datasab DS/20, a processor with 16K bytes of internal storage. It transmits data from terminals to the host computer and each accommodates up to seven terminals.

If the host is not operating, the processor stores transaction information on tape as it transmits it upon restoration of service. This approach eliminates the need to repeat every transaction that occurs during downtime.

The bank will enhance its data communications system in July. Remote terminal adapters will be installed at a branch to support the workload from another branch in event of downtime on its local processor.

The bank also plans to have smaller

branches share a single processor. This will occur next year, when Central Savings starts to open smaller suburban offices, as a result of a change in New York State banking laws that permits statewide

Terminal Transactions

branch banking.

The bank will soon install Datasab administrative terminal systems on the banking floor. The tellers will query the central computer on a wide variety of customer questions that are not related to transaction entries handled by tellers.

Edos/Pix Brings RJE Alternative To 360/370 Sites Running DOS

LARGO, Fla.—IBM 360/370 DOS users have an alternative to conventional remote job entry (RJE) without the associated costs of hardware and systems resources. The Computer Software Co. and Pandyne Corp. introduced last month a new RJE system using the Pandyne Pix equipment supported by the Extended Disk Operating System (Edos).

The system, called Edos/Pix, includes all of the remote operational flexibility normally associated with remote terminal operations without sacrificing any of the DOS processing performance. Through the Edos/Pix facility, operator spooling commands normally available only to the local operator are extended to the remote Pix operator.

The Pix Remote I/O system is a

communications package that replaces the terminal control unit (270X, 370X), modems, teleprocessing software and RJE terminals. Through Pix, remotely located printers, card readers and punches appear to the host system as local devices. They are supported by the same Edos spooling routines used for local unit record devices. The Edos/Pix combination provides the 360 or 370 user an RJE capability as well as increased processing capacity, the company said.

Pix costs \$1,325/mo. in its basic configuration, while Edos costs \$425/mo. on a 24-month lease. The software can be added to existing installed Pix systems. Pandyne is at 8550 Ulmerton Road, 33540.



How about a little price protection?

Controlling a data communication budget is tough enough. You don't need the extra problem of price increases on equipment you're already using. That's why ICC offers you price protection. You can buy ICC modems outright, or lease them for a monthly rate that won't change for the entire term of the lease — up to 36 months. Lease our Modem 24 LSI today for \$54 per month, and in 1978 your cost will still be \$54... even if tariffs have gone up. And even if our own prices have increased.

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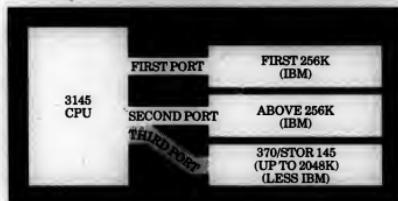
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Progress Report:

370/STOR 145

**ITS UNIQUE THIRD-PORT
NOW LETS YOU ADD ON TOP
OF ANY AMOUNT OF RESIDENT
3145 MEMORY.**



Most 3145 users have been stuck with high-cost IBM memory. Their processor has only two memory ports—one to handle the first 256K, the other to handle additional memory. That means low-cost independent memory had no place to attach, except with major wiring changes to the CPU. The result: only IBM memory could be used. But no more. Cambridge designed—and IBM approved—a totally transparent "third-port" memory that permits *any* 3145 processor to add *any* amount of 370/STOR 145 memory, regardless of the amount of resident IBM memory. No messy installation. No fear of incompatibility. Just plug in any amount you need.

And, with 370/STOR 145, you get more memory protection, more memory back-up, and more additional features than *anyone* else offers. Features such as highest memory addressing, no console file tampering, and super reliability.

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Subsidiary: Cambridge Memories GmbH, 6078 Neu Isenburg, West Germany 06102-36092.

SYSTEMS & PERIPHERALS

Bits & Pieces

NCR Microfiche Reader, Reader/Printer Available

DAYTON, Ohio — A low-cost, compact microfiche reader which magnifies microfiche images to three-quarters of the original size and a microfiche reader/printer which can produce electrostatic hard copies of images are available from NCR Corp.

The price of the "three-quarter" reader, called the NCR 456-500, is \$178. The unit weighs less than 17 pounds and measures 12 in. wide, 17 in. high. It is available with lenses providing magnifications of 18, 32 and 36-times.

The reader/printer, designated the NCR 458-500, allows users to make electrostatic hard copies of a microfiche frame with the push of a button. Priced at \$1,395, the reader/printer is available with seven lens magnifications ranging from 18 to 48 times.

RPM Rejuvenates Used Ribbons

BEVERLY HILLS, Calif. — "If you buy high-quality ribbons, there's no reason you shouldn't be able to get a second, third and even fourth run from them," according to RPM Computer Ribbon Corp.

Client firms send their used ribbons to RPM, which first inspects them for damage. Ribbons in good condition are reinked in the identical shade as the original, placed on new cores, resuscitated, shrunk, repackaged and mailed back to the sender.

According to RPM, the reinking fee costs considerably less than a new ribbon, as much as 50% less depending on the volume of the order.

RPM Computer Ribbon Corp. is at 8500 Wilshire Blvd., Suite 505, 90211.

Kodak Introduces Four Films

ROCHESTER, N.Y. — Four films designed for micrographics and COM applications have been introduced by Eastman Kodak Co.

- Recordak AHU microfilm is primarily for exposure in standard rotary microfilm devices.

- Recordak print film (Estar thick base), SO-215, is designed to produce flatter microfiche.

- Recordak Dacomatic E film is intended primarily for alphanumeric COM units employing high reduction ratios.

- Recordak Dacomatic G film, SO-280, is designed for COM systems with graphic capability and will be available in May, Kodak noted.

OVERLAND PARK, Kan. — "Valley View Computing Systems handles DP for many different customers, using a wide variety of jobs and processing a large number of small batches. We can't afford to increase our staff," says G. O. Lamb, executive vice-president, Valley View, summarized the data entry operations of his service bureau operation.

Valley View is now handling its professional billings with a 35% improvement in productivity, thanks to more sophisticated data entry and source data collection techniques.

The application of remote data collection concepts, in conjunction with improved data entry operations, has enabled Valley View to reduce its error rate, vastly improve turnaround time and increase its customer base while actually reducing overall costs.

Valley View processes its workload on 10 IBM 360/30, with five 2314 disk drives. Prior to October 1974, the necessary data entry operations were accomplished using seven IBM 3741s.

In October, a key-to-disk entry system was installed to replace the 3741s. "We have, as expected, drastically cut the error rate and improved turnaround time. In addition, much to our delight, the remote entry capabilities of this system have enabled us to increase our customer base while decreasing overall costs."

Valley View's data entry operations currently utilize an IBM 3741 System 380 with 10 Data/Scope keyterminals, seven centrally located and three used as remote entry terminals at customer locations. This System 380 includes expanded editing capabilities (allowing sort operations and automatic batch and record edit) and a remote operator station to accumulate operator information by the day, week or month as required.

SiZable DP Workload

Valley View's DP services involve complex data management for five banks, including one giving service to an average of 500,000 demand deposit accounts (including Micr), 10,000 savings account transactions and 200,000 accounts receivable statements, averaging 51 char./record and 8,000 loan transactions using 70-character records.

Utilizing the automatic functions of the System 380, operators need key only 70% of the records; the system automatically calculates and inserts the remaining information, reducing keystrokes by 30%.

Once the data is entered, out-of-balance batches are automatically printed out by the system for correction. Previously,

they were printed out by the mainframe in a separate run.

In addition to its banking services, Valley View performs professional billing services as well as insurance transactions for 150 agencies, including complete DP services for several clinics.

These medical transactions amount to 600,000 record/mo, averaging 51 char./record. As with the banking transactions, operators need now only key 70% of each record, resulting in fewer errors and faster turnaround time.

Distributed Data Entry

Several of Valley View's clients have installed remote keyterminals in their offices to achieve accurate source data capture and final processing within a 24-hour turnaround time. The rationale behind this action is two-fold:

- Remote keyterminals decrease overall turnaround time and eliminate the logistic problems involved in moving the source data to a central location.

• Remote keyterminals help maintain data control and source documentation at the customer's level, thus eliminating the necessity of returning in-error source documents to the customer for correction.

Lamb also stated that, aided by the operator-oriented features of the system,

CMI 370/Stor Ups 158 Memory To 4M Bytes at 70% of IBM Cost

BEDFORD, Mass. — An add-on memory system for IBM 370/158 computer processing is being introduced by Cambridge Memories, Inc. (CMI).

The 370/Stor 158-3 memory is expandable in increments of either 512K bytes or 1M bytes up to a maximum of 3M bytes per single chassis. The system can expand 158 processor models, I, II and K to 370/158 and 370/164.

Its price ranges from 30% to 40% below IBM memory price, depending upon model and use terms, CMI said.

The system also offers a new alternative to establishing costly multiprocessor configurations for extra reliability. Because of 370's multiprocessor panel capability, users can effectively duplicate main storage on a single 158 processor under operator control.

This mode does not provide the additional processing power of a multiprocessor system, but it does assure the availability of two separate memory systems

for critical on-line applications at a far smaller investment, CMI said.

The 370/Stor 158-3, which supports multiprocessor 158s of differing main storage sizes, makes 370/Stor 158-3 suited for a main-memory backup function, CMI stated.

A memory reconfiguration switch enables operators to remove failed sectors of 512K bytes of storage from operational use. The memory also has automatic error detection and correction and detection of multithread errors, and an off-line switch that permits continued operation of 370 with no IBM memory on line.

A typical 1M-byte memory unit added to a 370/158 resident 1M-byte memory costs \$155,000 on a purchase basis — or 38% less than IBM list price, CMI said. On a lease basis, the same 1M bytes are priced at \$4,000/mo on a five-year lease, with separate maintenance.

CMI is at 12 Crosby Drive, 01730.

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RAYTHEON



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If you're involved in the construction of a bridge, you know that the operation of the bridge is critical to the success of the project. In fact, it's absolutely essential. That's why it's important to have a team of professionals who are experienced in the design and construction of bridges. At [Company Name], we have a team of experts who are dedicated to ensuring that your bridge is built to the highest standards of safety and durability. We understand the importance of safety in bridge construction, and we are committed to providing you with the best possible service and support. So if you're looking for a reliable partner in bridge construction, look no further than [Company Name].

Pilot CAI Program Under Way In Elementary Schools of UK

GLASGOW, Scotland — The initial phase of the UK's first Computer-Aided Instruction (CAI) program at the elementary school level is scheduled to become operational here this spring.

During the pilot stage of implementation, 10 elementary schools will be covered. A Univac 418-III computer is the key to the Glasgow system.

Full implementation of the first stage is planned to take place over a 12-month period.

Directed by the Education Department of Glasgow Corp., the network is based on a similar system using a 418-III computer which has been operated successfully by the Chicago Board of Education for more than three years.

100 Terminals

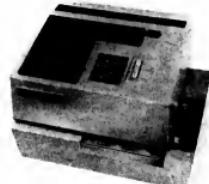
Each of the 10 schools will be equipped with 10 Uniscope 100 visual display terminals and one DCT-1000 printer-type terminal. If the pilot project is successful, plans are to extend the system to other city schools. The computer is designed to support a CAI network totaling 50 schools.

Programs written by Unisys for the Glasgow project are prepared according to specifications drawn up by Computer Curriculum Corp., Palo Alto, Calif. These programs apply the "drill and practice"

method of individual instruction. The program continuously monitors each child's performance and is designed to supplement conventional classroom instruction.

The system is geared to letting each child perform at his own rate of speed using the Uniscope 100 display terminals to guide him through a series of small steps. Performance data on each child is printed out daily on the teacher's DCT-100 terminal.

Although principally directed for use in elementary schools, some applications of the Glasgow CAI system will also be available for secondary school pupils showing difficulty in keeping up with their classmates. The older students will use the equipment after the primary schoolchildren have gone home.



Standard Register Weighmate

Standard Register Offering Weighmate, Source Record Punch

DAYTON, Ohio — Weighmate, a calculating source record punch (SRP), has been introduced by The Standard Register Co.

The device is designed to accept binary coded decimal (BCD) output from electronic weighing systems for computation and then output on multiple-copy Zipcode forms which can be card copies for input to other systems.

An item's gross weight is accepted from the scale and entered either directly, if the units are cable-connected, or from the keyboard. Other information can be entered through the keyboard and the unit computes the net weight displaying all figures for a visual check.

That data plus information from other input will be transferred to the Zipcode form along with the printed interpretation.

Additional sources of input include extra keyboard entries, master tab card, badge, the SRP internal slide switch settings and clock or other digital BCD output device.

The machine has a 10-key keyboard and weighs approximately 95 pounds. An option is available permitting the accumulation of net weights from multiple transactions and entering this data each time into the Zipcode form along with the individual transaction data.

Prices for the units will start at \$7,600 or \$260/mo rental from the firm at 626 Albany St., 45401.

Input Unit Speeds Check Processing

GAITHERSBURG, Md. — A processing system for checks and credit card invoices is scheduled to go into operation at Bank/Virginia headquarters in Richmond, Va., in July.

The system, from Input/Output Machines Corp., is built around an input device which extracts predefined areas of handwriting (the payee and payer) from checks and the entire customer record from standard-form credit card invoices.

The printout for checking account customers is a monthly statement bearing the image of the payee and payer entry and the amount of the transaction as it appears on each check listed in numerical order along with the date of processing and the consequent account balance.

For credit card customers, the statement reflects complete images of signed invoices on a single sheet.

The input machine also records on microfilm a photograph of the check (front and rear) or credit card invoice form. The microfilm can be used for retrieval and duplication.

The input machine is said to handle up to 12,000 item/hour. The output machine produces statement pages at the rate of three sec/page, the company said.

Benefits include elimination of fine sorting, handling and postage charges. Up to 150 line items can be mailed under the lowest postal rate with the bulk of checks and credit card invoices eliminated, the firm said. The images extracted for printout are digitized so that existing computers can manipulate the data.

The input machine is priced at \$135,000; the output machine will sell for \$140,000 from the firm at 1 W. Deer Park Drive, 20760.

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- Automated systems interface
- Flexible reporting
- Easy to use report writer
- Foreign currency accounting

Second, fourth generation design with a single master file affords easier installation and maximum operational efficiency/reliability. It allows user control with a minimum of EDP intervention. Documentation is outstanding.

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System Calculates Discounts for Liquor Wholesaler

ST. PAUL, Minn. — Nearly everyone in the business offers cash discounts for volume sales and purchases, but Johnson Brothers Wholesale Liquor Co. provides other discount options too.

Moreover, it has developed a computerized system to invoice them quickly and accurately.

"We account change every week or two," said Douglas M. Mangine, the company's director of internal operations, "but it

takes no time at all to update our computer files."

"Counting different brands and sizes, we stock more than 1,700 different items," Mangine explained. "No one salesman could possibly provide a customer with the kind of service he needs if the salesman had to keep record of discounts and special buys for everything in carry."

The headquarters here processes up to 1,500 orders per day.

Even before such volumes became routine, management saw that conventional accounting techniques would not be adequate for maintaining 24-hour turnaround on orders.

Upgraded to Century 101

In January 1974, the company upgraded its DP capability by installing the keypunching of customer data into the main codes, the quantities and a discount code if applicable. After

addition to a 32K CPU, the 101 has a card reader, a 1,200 line printer, a 100M 50M-byte NCR 657 disk drive.

The four-option Johnson Brothers discount is calculated when applicable according to the preference of customers when orders are prebilled. Input requires the keypunching of the customer code, the main codes, the quantities and a discount code if applicable. After

making sure the new order does not exceed the credit line and limit for each account, the computer checks the perpetual inventory maintained in disk storage to be sure the order can be filled.

With any back-order notations made as necessary, the order is printed out on an eight-copy form. Upon completion of the first copy, a street ship label is attached and a carbon which reproduces the information on the first copy is used to identify all boxes for delivery.

In addition to extended prices and discount data, the invoice includes the warehouse location for picking each line item and identifies the company truck route or common carrier the order is to be delivered by, along with any special instructions.

Automatically, Mangine said, since all information is stored on magnetic disk packs, the processing of on-order billing debiates the perpetual inventory, updates accounts receivable, adds to the cumulative commission earnings of salesmen and compiles detailed sales statistics.

Daily Management Printouts

On a daily basis, he said, the computer produces the following management printouts:

- A sales register which shows how much each salesman sold of each brand to which customer, along with the individual dollar total.
- A cumulative gallonage report for the state government.
- The inventory status for each item in stock, along with the safe and economic reorder points.
- Sales by supplier, broken down by item.
- The activity of each salesman by item.
- The sales for each supplier by salesman, by customer and by item.

There is some redundancy, but redundancy is the same body of information with different emphasis helps management get a clearer picture of specific areas of activity, Mangine said.

This can be done economically with the computer, he said, because all of the statistical breakdowns are produced during the normal business day after the on-order billing and inventory stocking has been processed.

On a weekly basis, reports are printed. These reports are composed of the gross volume done by each salesman per invoice, the dollar volume done by each salesman and the gross profit he earned.

An on-call inventory status report compares the current year sales figures with the breakdown by salesman and by customer shows current sales, those for the previous month and the one before that, those for the year to date and those for last year to date.

An on-call 10-day report reveals trend performance by case with those of the 12 previous months.

The accounts receivable system is an NCR-supplied system that allows for both open-item and balance-forward statements. It does aging on daily basis and produces statements on call.

NOW 551 Per Month Buys You DATA 100 Batch Terminal Performance



The new DATA 100 Model 2000 Batch Terminal is a high performance computer system designed for the needs of the business community. It is a complete system consisting of a central processing unit, disk drives, a keyboard, a monitor and a printer. The system is designed to be used in a batch processing environment, providing high performance and reliability.



MINIWORLD

Prepares Firm's Financial Reports

Mini Bits

PDP-8/I Handles 64 Lines With Standard Interface

WELLESLEY, Mass. — The Asynchronous Line Interface (ALI) from Standard Information Systems is the Digital Equipment Corp. PDP-8/I or PDP-8/E with external bus to handle up to 64 lines, with the ALI providing program control of line speed, word size and parity, the vendor said.

ALI provides program control of eight speeds between 300 and 3,600 bit/sec, selects the ends of messages, "break" signals and transmits breaks. Echo and loopback capabilities are included.

The equipment rack-mounts into the PDP-8. A 32-line configuration costs \$9,100 from the firm at 36 Washington St., 02181.

Wang Drive Accepts Standard Tape

TEWKSBURY, Mass. — A 9-track tape drive from Wang Laboratories, Inc. accepts industry-standard 800 bit/in., half-inch, magnetic tape and adds computer data exchange and archive storage capabilities to Wang's WCS and S/2000 computer lineups.

The Model 2209 tape drive, which reads and records in universal NRZI mode on reels up to 10-1/2 in. in diameter, comes with software that eliminates the need to program tape-handling operations (blocking, file positioning, etc.).

Additional features include automatic error-recovery routines and programs to interface the tape drive with other Wang peripherals such as disks and telecommunications controllers.

The drive also includes a built-in tape cleaner. Reading and recording speed is 12-1/2 in./sec.

The tape drive sells for \$12,000, while the input/output logic is \$300.

The firm is at 836 North St., 01876.

Add-On Memory Plugs Int'l-PPC-11

ENGLEWOOD, Colo. — The Monostore VII/DPF-11 from Monolithic Systems Corp. is a semiconductor memory system designed to plug into the Digital Equipment Corp. DPF-11 Unibus.

The add-on system is based on a 4K by 1 bit NMOS dynamic random-access memory (RAM).

Standard units are wired for 64K or 128K with word lengths of 16 or 18 bits. Other organizations are available.

The minimum capacity of 16K by 16 or 18 bits is expandable in 4K increments. Dual port systems are available.

A 128K by 16 bit system costs 66 cent/bit from the firm at 14 Inverness Drive East, 80110.

VIP-100 'Understands' Human Speech

HAYES, England — Some of the problems of control, statistics and accountants face with computer-based management information systems have been eliminated at EMI Ltd. by using speech to communicate with the computer.

Said to be one of the first operations of its type in the world, accountants with EMI's \$100 million Commercial Electronic Operations capture monthly financial information on a system which understands the human voice.

The approach eliminates the intermediate paperwork and card punching/verifying normally associated with data preparation.

The financial staff members themselves speak the information or instructions to the Threshold Technology Inc. (TTI) (

VIP-100 to provide the monthly financial statistics based on data received from the group's 16 subsidiary companies and divisions.

The TTI equipment used includes a speech processor unit, minicomputer, visual display unit, microphone headset and teletypewriter.

Processing Statistics

To enable the system to process these monthly statistics, a small, selected vocabulary of words and phrases are spoken into the system. As the user speaks the financial data, each word is recognized and the minicomputer performs the data analysis, formatting and reporting according to the program of operations loaded in its memory.

First-time users of the voice-operated

computer system "teach" the equipment to understand their individual pronunciation of the vocabulary by repeating each word five to 10 times into a microphone. As information is voice-entered, each word spoken appears on a visual display unit enabling the user to verify his input. After the information has been entered, the system produces a typed printout for reference purposes and a punched paper tape for subsequent computer entry.

John Perera, chief accountant of EMI's Commercial Electronics Operations, said, "The system became operational after the first test run for the last two months. It has provided management with the main financial and operating statistics of each division together with consolidation and summaries with 100% accuracy."

Nova System to Help Guide Panama Canal Ships

By Patrick Ward
Of the CIA Staff

PANAMA CITY, Panama — A minicomputer may soon be central to the Panama Canal Co.'s task of guiding ships from one side of the isthmus to the other.

The company assigns its own experienced pilots to take command of a ship during the transit. But even if the pilot is familiar with the canal, it still helps him to know a lot about the ship he is temporarily handling, according to David Prongay, manager of product development for Boeing Aerospace Co.'s Houston branch.

Boeing has assembled and programmed a minicomputer system that will provide pilots with that sort of information, and will also alert the Marine Traffic Control Center Staff on what resources they'll need to handle particular ships.

The system will be valuable since about 40 ships already transit the Panama Canal in both directions daily, and the number is expected to rise in the future, further taxing both the marine traffic controllers and associated support operations.

Due to become operational next summer, the system will also display a 48-foot-long "ship position display board" for the benefit of the ship controllers at the traffic center, Prongay stated.

The minicomputer system is built around a Data General Nova 840 under DODC software and Digital Development Corp. disk and tape drives. The minicomputer, a Peripheral Interface Corp. tape interface and Cipher Data tape drives.

The ship controllers will work at 30 Contrac CRTs at the traffic center. A Ramtek display generation unit will drive the CRTs.

Other canal officials will enter data and receive reports on 24 remote GE Termi-

net terminals.

The traffic center plans to put a base of 8,000 to 10,000 ships on the system. By entering the name of a ship about to enter the canal, the traffic center staff will obtain a report on the ship's position, the ship's speed, the type of piloting crew the canal company will have to assign to it and towing and other requirements.

Another software module will match up the canal company's available pilots with particular ships. Pilots will receive an information package for the ship to help them in piloting and a planned schedule

for the ship's transit through various points in the canal.

The ship traffic display board, built of four connected sections six feet high by 12 feet long, will reflect information entered along the length of the canal. Lit numbers will signify each ship's position, and the system will also indicate fog patches, lock trouble or other problems.

The Boeing turnkey system will cost the canal company about \$2.6 million, Prongay said, including training and one-year maintenance.

Basic/Four 24K Machine Cuts Time Between Billing, Job End

BALTIMORE — No one in the printing business needs to be told time is money. By shifting its accounting work from tab equipment to a 24K minicomputer, French/Bray printing company here cut its accounting time in half, from 10 days to two weeks, according to Vice-President Paul Stotler.

Beyond that, management reports from the previous system often came too late for corrective action, he said. The minicomputer equipment is producing much more quickly.

The minicomputer had become outmoded by the time the company hit \$2 million in annual sales, Stotler said. Sales should reach \$3 million this year.

Moved to Basic/Four Mini

French/Bray decided on a Basic/Four Corp. machine after visiting other print-

ing firms that used mini together with software developed by T.H. O'Mara, Inc.

French/Bray currently uses its mini for payroll, cost accounting, work in process, accounts receivable, accounts payable, analysis, production reports, salesmen compensation, productivity performance and some inventories.

The system is now being programmed for inventory control of raw printing paper. French/Bray is also considering automated job costing software, but that is "off somewhere in the future," because of the number of variables involved, Stotler said. However, "we feel it is an attainable goal," he added.

French/Bray uses a Basic/Four Model 400 processor, a disk drive with one fixed and one removable disk, a 165 char/sec printer and a CRT.

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Our competitors are cutting each other to ribbons in a price-slashing contest.

We can't afford to cut prices. Because you can't afford to have cut-quality ribbons on your printers.

Really, your main concern should be the cost and quality of printing per line.

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Division makes over 250 types of ribbon; we make them of the highest quality nylon; and we check ink density (by weight percentages) so that you get evenly distributed, metered ink throughout the ribbon.

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HP 3000 Reduces Financial Risks in Resources Search

HELSINKI, Finland — Geological Survey of Finland (GSF) has installed a minicomputer system as an aid in its national search for natural resources and has become an indispensable tool in minimizing the financial risks in prospecting.

"Modern prospecting is very much like detective work," noted a GSF scientist. "We are feeding the computer large amounts of data, access to varied data we can uncover. From all these clues, the computer will draw the logical con-

clusions, but the conclusions can be only as valid as the clues themselves."

Because this modern prospecting procedure requires continuous computer-human interaction, GSF chose a computer offering terminal capability. The Hewlett-Packard (HP) 3000 enables several users concurrent access through both interactive terminals and batch processing.

Tailored to the needs of the institute, the minicomputer system offers Fortran; Basic; and SPL, HP's systems programming

language. Users also can have access to on-line test instruments and special peripherals through an HP 2100 programmable controller.

In one application — airborne geophysical surveying — instruments aboard a plane gather 10 geophysical parameters together with time, altitude and navigation data. The minicomputer later processes that information and merges it with data from samples taken on the ground.

The results are maps drawn by

the computer that indicate magnetic, electromagnetic and radio-metric anomalies indicative of ore deposits and other geological structures.

In the search for mineral deposits, rivers and springs within a "geologically interesting" area are systematically explored. Collected sediments are analyzed and some 20 elements and their respective concentrations in the samples are identified.

This geochemical data and information on the location and general environment of the area

where the samples were gathered are entered into the minicomputer system. The resulting maps locate concentrations of each element or combination of several of them present within the area.

The HP 3000 system hardware includes a 2-Mbyte fixed-head disk, a 47-Mbyte moving-head disk, an HP 2100 programmable controller with 8K of memory, a 3008-bit/m magnetic tape drive, 200 line/min printer, 600 card/min card reader and a photoreader.

Comtal Releases High-Resolution Image Processors

ACADIA, Calif. — Comtal has introduced a series of digital image processing systems featuring four times the spatial resolution of its previous available digital image displays.

The 1024 series stores and processes image information in a digital manner. The operator may interactively work with the high-resolution images in real-time. The systems employ a 1K by 1K picture matrix which produces a clear, sharp, bright and flicker-free picture, the company said.

Three Bit Sizes

The 1024 systems are available as a 4-bit system which stores and processes 16 brightness levels (shades of gray), a 6-bit system for 64 brightness levels and an 8-bit system for 256 brightness levels.

The systems interface with most major minicomputers, the firm said.

The 1K-by-4-bit digital image processing systems start at \$55,000 from the firm at 333 N. Santa Anita Ave., 91006.

Storage Future Workshop Topic

LAKE ARROWHEAD, Calif. — The IEEE Computer Society will sponsor a workshop on "Advances in Storage for Minis and Micros" here May 3-4.

The workshop will examine the future of mechanical memories and serial solid-state and optical devices. Also to be studied is the architectural implications of these developments as they influence minis and micros.

An invitation to the workshop is available from R. Bennett, Burroughs Corp., 25725 Jeronimo Road, Mission Viejo, Calif. 92675.

Versatec Lowers Prices

CUPERTINO, Calif. — Versatec has reduced prices from 5% to 15% on its dual-array electrostatic printers and plotters. Versatec officials say higher volume has significantly reduced production costs.

The price reduction covers the entire line, including the high-resolution, dual-array, 200 dot/in. D1200A printer/plotter. This unit has been reduced in price from \$9,700 to \$8,400. The firm is at 10100 Bubb Road, 95014.

Lockheed System III

The only multi-terminal small business computer you won't outgrow every time you grow.

Introducing the Lockheed System III, now with new multi-terminal capability. That's good news whether you plan to use a small computer system or plan to sell them.

System III is designed to grow with you. You can buy what you need now, expand systems when you want. With the new multi-terminal System III models, you can connect up to eight auxiliary terminals, both local and remote. That means nine people can be using the computer simultaneously. With the capability, System III is the most cost effective business computer you can buy.

Interactive capability includes data inquiry/entry and on-line file updating. Each terminal features multi-function foreground operation. And what could be better for inventory control and order entry applications, while your batch processing continues in the background.

Plus you've got a system supported by industry compatible RPC II software, as well as assembly language and FORTRAN. System III also includes File Management,

Sort/Merge, operator utilities and editors, all under the control of the Disk Operating System. It can be expanded to 64K bytes, four disk drives providing 20 million bytes on-line, up to 600 LPI printer, and six models of 80 and 96 column cards.

So if you're interested in a small business computer that can be eight times more useful to you, let's talk. If you want information about using the Lockheed System III, call our nearest office. If you'd like to become a System III dealer, call 201/257-7540. Or write 6201 East Randolph Street, Los Angeles, CA 90040.

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• Denver 381-2000 • Minneapolis 347-2841

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Lockheed Electronics

Data Products Division



On to NCC . . .

This section previews the products that will be shown at NCC next week. The agenda and a schedule of adjunct meetings are also included.

HP to Exhibit M/30 Processor, Real-Time Executive for 21MXs

ANAHEIM, Calif. — Hewlett-Packard (HP) will demonstrate its real-time executive (RTE-III) and exhibit the M/30, newest in the 21MX line of processors, in booth 1437.

In addition, the firm will show the Model 7905A 15M-byte cartridge disk drive with a usable data capacity of 10M bytes. It also features a 5 msec track-to-track seek time for a 25 msec average.

dynamic mapping is similarly \$13,629. The least-expensive 128K model (which uses an extender) is, on the same terms, \$23,859.

Mineworld At NCC

Data transfer is at a rate of 7.5M bit/sec. The 7905A disk drive with a 13037 controller is priced at \$8,400, with additional drives priced under \$5,900.

The disk-based real-time executive RTE-III can manage as much as 256K words (512K bytes) of memory and can translate up to 16M bytes into multiprogramming, multilingual machines with I/O spooling and multiterritorial monitoring capability, HP said.

Up to 64 multiteritorial partitions can be defined for simultaneous use, executing and developing programs and managing data in a variety of high-level languages including Fortran IV, Algol and Real-Time Basic.

The system includes a file manager for easy access to random or sequential files. Disk storage can start at 5M bytes and can be expanded up to 118M bytes.

Top of the Line

The newest processor in the Hewlett-Packard 21MX line, the M/30, is the top of the line in memory and power I/O accommodations, HP claimed.

The processor can self-contain up to 128K words (256K bytes) of high-density semiconductor memory and 14 powered I/O channels. The M/30 processor now makes it possible to configure a 128K 21MX at a price 25% lower than with earlier hardware, HP said.

The standard configuration of the M/30 has 128 instructions, including floating-point firmware, memory parity, extended arithmetic unit, bootstrap loader and full operator panel.

The price of an M/30 processor with 32K words of 4K random-access memory (RAM) can be as low as \$8,382 in OEM quantities of 50. A 64K model with

Two Core Memory Systems For GA SPC-16 to Be Shown

ANAHEIM, Calif. — Two core memory systems designed to operate with General Automation's SPC-16 line of computers will be unveiled by Standard Memories in booth 2304.

The units are available in 16K-byte or 32K-byte sizes and are pin-compatible with all members of the SPC-16 line, Standard said.

Units compatible with the SPC-16 are also available, the firm added from its Fort Lauderdale, Fla., headquarters.



Say goodbye to PDS compression. Say hello to UCC SIX!

Announcing UCC SIX. A new software package that eliminates PDS compression, because it automatically inventories and controls your PDS disc space.

UCC SIX means the virtual end of ABENDS and "dump and restore" operations caused by exhausted PDS disc space. Go ahead and use the programmer and machine time normally needed for compression on more important jobs...like mailing schedules. You even save money on your disc investment, since UCC SIX utilizes PDS space more efficiently.

Go ahead, say so long to some old nuisances. Introduce yourself to a new friend. UCC SIX.

- Please send me more information on:
- Have someone call me about:
- UCC ONE (Tape Management Software). A system that protects data and order disc operation. Provides real-time record of tapes, jobs.
- UCC TWO (Data Catalog). Lets you run DOS programs under UCC. Provides a helpful reference. Prevents confusion. Puts you in charge. Saves time, money.
- UCC SIX (PDS Space Management)
- UCC TEN (Data Dictionary/Manager). For IMS users, this system converts and translates data. Provides powerful cross reference features. Automatically generates data base control statements, facilitates new systems design.
- UCC FIFTEEN (Restart Management System). Saves hours on restarting UCC jobs. Simplifies software and hardware automatically connects DIS catalog. CIGD boots before you run or restart.

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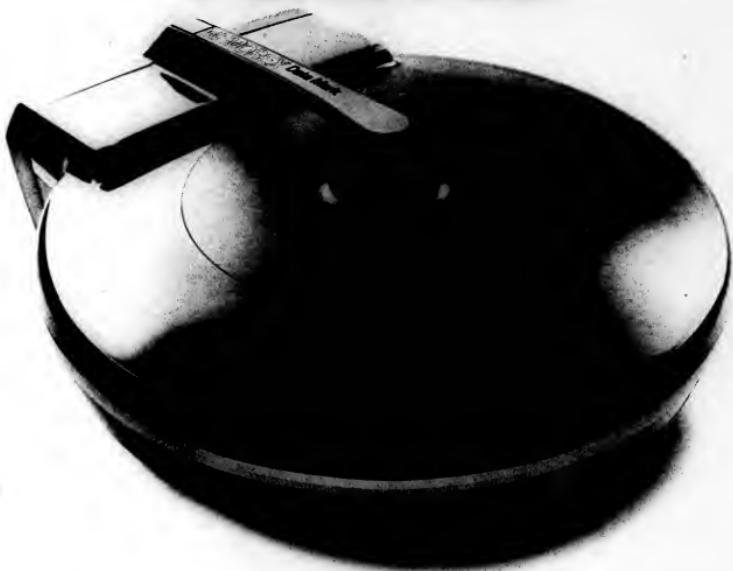
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The new Memorex Data Mark Module has been so well received in the marketplace that there are more Data Mark in use today than those of all the independent competitors combined.

To produce a reliable product like Data Mark requires years of experience in manufacturing digital media, magnetic recording heads, and disc drives. Memorex's 12 years of experience led to the proprietary formulation and processing techniques for the recording coat of Data Mark that makes it unique. This tough "armor coat" significantly extends the Data Mark's durability and enables it to withstand increased stress of head landing.

In addition to the armor-tough recording coat, the Data Mark features the durable Memorex 100X top coat. This smooth, durable shield protects your valuable data and, working in combination with the recording coat, extends the life of the disc over 100 times the life of a normal disc that does not have the Memorex dual shields.

The key reason the Data Mark has been so well received is because of its unique oxide particle alignment. The oxide particles are encapsulated in the extremely thin coating and circumferentially aligned on the disc. And it's precisely this alignment that is responsible for the Data Mark's high signal output and data resolution.

The Data Mark stores 70 million bytes and is available with the fixed head option. Either of the two configurations gives you the memory excellence from which Memorex has gained its reputation.

Call your Memorex representative or write: Memorex Corporation, 1125 Memorex Drive, MS-0064, Santa Clara, California 95052.

MEMOREX

Sykes Plans Diversified Display

ANAHEIM, Calif. — Sykes Datatronics, operating out of booths 2605 and 2607, will be displaying four basic products: floppy disk systems, floppy disk controllers, communications cassette systems and 3M cartridge transports.

The Series 7000 flexible disk system provides one or two IBM-compatible disk systems, complete with interfaces to a variety of minicomputers. Available software consists of diagnostic, sample drivers, IBM routines and complete operating systems. A dual sector buffer option is also available.

The controller portion of the flexible disk system is available for OEM applications. The controller is housed in a single card cage which may be adapted to a user's package.

The dual sector buffer option is also available, as are buffers for several different disk drives and different

minicomputers. The price of the controller is \$610 in quantities of 50 per year.

The Series 3000 single or dual cassette system with an RS-232 communications interface will also be displayed. This system offers either on-line or off-line operation, and provides interfaces for modem devices as well as terminal devices.

Options include high-speed search and typical single transport units sell for \$2,600.

The firm will also display a 3M cartridge tape unit, booth 2714. This system provides one-, two- or four-track capability with either a standard read/write head or an optional read-after-write head.

DEM pricing at the 50 quantity level is \$511, the firm said from 375 Orchard St., Rochester, N.Y. 14606.

3330 plug-compatible disk drives from Randolph

RCC/7330 disk drives provide IBM S/360 and IBM S/370 users with high performance at savings of 30% or more

Over eight thousand Model 7330 disk drives are running round-the-clock on S/360, 50.65 and S/370 throughout the U.S. They match the performance of IBM 3330 disk drive in every vital comparison except one — price.

The RCC/7330 disk drives offer Randolph customers savings of 30% or more and you still get the same average capacity of 100 or 200 million bytes per spindle, transfer rate of 800,000 bytes per second and error correction with automatic detection and retry.

RCC/7330 Storage Control Unit — key to high performance at low cost

Plug-to-plug compatible with IBM's 3330 on S/370. Connects to S/360/50 and S/360/65 via a selector channel.

Provides for control of one to sixty-four RCC/7330 disk drives, permitting incremental storage additions of 100 or 200 million bytes up to a 6.4 billion byte system.

Dynamically-balanced capability offers substantial advantages over switching to the multiple CPU and/or controller user by allowing simultaneous access to spindles in any system.

RCC/7330 uses IBM 3336 or equivalent disk packs

Each pack is interchangeable on any RCC/7330 or IBM 3330 drive. Provides nineteen surfaces for data storage. The twentieth disk surface is used to control servo-seeking, track following, rotation-position sensing, end data clocking.

Do you have an IBM S/370 (or S/360 50.65)?

Your Randolph District Manager can show you how to expand your EDP operation — and reduce your costs — with a Randolph lease program tailored to your specific CPU and disk storage requirements.

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American Videonetics to Launch Magnetic Cartridge Recorders

ANAHEIM, Calif. — Two cartridge recorders will be introduced in booths 2714 and 2716 by American Videonetics Corp.

The DI-112-03 has a capacity of 152M bits or 1.4-in. bytes and has a read transfer rate of 1.4 in./sec. When the unit is formatted as a typical floppy disk (256K bytes), random access time is said to be 50% faster than floppy disk.

Because of the storage capacity, the unit can store the equivalent of 50 floppy disks on a single tape and move from "disk" to adjacent "disk" in less than .4 sec. Moving from the first to the 10th "disk" down the line takes 3.5 sec, the firm said.

The unit is priced at under \$1,000 per drive only in OEM quantities and \$1,200 for a drive with basic read/write electronics and control software.

The MDR-212 uses a "Reellette" that contains 80 feet of 1/4-in. tape. There are two models of the Reellette, containing room for either 750K bits or 1.5M bits of unformatted data.

Miniworld At NCC



Standard operating speeds are 10 in./sec read/write and 30 in./sec gap search. The lower capacity model will sell for less than \$140 per drive only and under \$300 per drive with read/write electronics and motion control.

The high-capacity unit with electronics will be priced at under \$540 in OEM quantities, the firm said from 795 Kifer Road, Sunnyvale, Calif. 94086.

Wangco Showing Drive Equal to S/32 Module

ANAHEIM, Calif. — Wangco will show a nonremovable media magnetic disk drive, featuring capacities equal to the recently announced IBM System/32 disk storage module, in booth 1517.

The N/S32 drives utilize Wangco's electromagnetic voice coil actuator and optical detect system, providing track-to-track access time of 15 msec and full track time of 150 msec, with 70 msec average.

The N/S32-2222 features two fixed disks, 200 track/in. and recording density of 2,200 bit/in., providing 100M bits of capacity.

The N/S32-2212, with one fixed disk, has a capacity of 50M bits. Both models have a transfer rate of 2,000 kbit/sec at a disk rotation speed of 2,400 rpm.

DEM quantity price is under \$2,000 from the firm at 5404 Jandy Place, Los Angeles, Calif. 90066.

Semiconductor Memories To Be Monolithic Theme

ANAHEIM, Calif. — Among the semiconductor memory products Monolithic Systems Corp. will feature in booths 1500, 1502 and 1504 is the Monostore V/PDP-8/EFM add-on memory board that plugs directly into the PDP-8E, F or M Unibus at half the price of the conventional add-on memory board.

A second product, the Monostore VII/PDP-11, a low-cost semiconductor memory system designed to plug into the PDP-11 Unibus, will also be displayed.

The VII/PDP-11 is based on a 4K NMOS dynamic random-access memory (RAM) and provides up to 128K by 18 bits in a single 5-1/2-in. high freestanding or rack-mounted chassis.

Standard units are wired for 64K or 128K with word lengths of 16 or 18 bits. In addition, Monolithic will display its Monostore VII/Planar, a read/write random access semiconductor memory designed for use with microprocessors.

Single-unit price for the V/PDP-8/EFM is \$560 for the 8K system. The VII/PDP-11 costs .66 cent/bit for the 128K by 16 system.

Halon 1301 to Be Put Out

ANAHEIM, Calif. — Dupont will demonstrate the capabilities of Halon 1301, a fire extinguishing agent, in booths 1121 and 1123, the firm said from its headquarters in Wilmington, Del. 19898.

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**Who knows more about telecommunications
than the telephone company.**





Basic Timesharing Model BTI 4000

Can Serve 256 Users

BSI Showing Interactive T/S Unit

ANAHEIM, Calif. — The BTI 4000 minicomputer-based interactive time-sharing system will be featured in the Basic Timesharing booth, 1221.

The system features units so the workload can be shared by a system's central processors and disk storage facilities, permitting a system with eight processors to serve up to as many as 256 concurrent users. Disk storage is expandable to more than 4 billion bytes online, the firm said.

The system, three models of which are the 4000/10, 4000/20 and 4000/30, differentiated by the type of disk controller and disk capacity, with the smallest permitting up to 10M bytes per controller in 2.4M-byte increments, the middle model expandable to 295M bytes per controller in 3.6M-byte increments and the largest expandable to 590M bytes per controller in 7.3M-byte increments.

Recortec Introducing Computer Tape Copier

ANAHEIM, Calif. — The Recortec computer tape copier — which will be introduced in booths 1304 and 1306 — was designed to duplicate 1,600 char./in. phase-encoded tapes.

Fewer than 10 minutes are required to copy a tape up to 7,400 ft. reel, the firm said, adding that this could permit users to never take original tapes out of the tape library area.

The system also allows library personnel to write headers, verify incoming data tapes or archival tapes while cleaning them and read and evaluate scratch tapes, the firm said.

The computer tape copier, which uses two high-performance tape drives, is priced at \$24,750, according to Recortec, Inc. at 777 Palomar Ave., Sunnyvale, Calif. 94086.

Interdata Bringing 8/32 To Highlight Its Exhibit

ANAHEIM, Calif. — The recently announced 8/32 minicomputer will be the highlight of the Interdata display in booth 2337.

The system features 32-bit architecture with up to 1M bytes of directly addressable memory, an effective cycle time of 450 nsec and a 240 nsec processor cycle time, in addition to floating-point arithmetic.

The firm will also be displaying its 30 char./sec. Canuseel serial impact printer, which features microprocessor control and digital stepper motors, and the 7/16 minicomputer system, the firm said from 2 Crescent Place, Oceanport, N.J. 07757.

National Semi Sending Pace

ANAHEIM, Calif. — A working exhibit of the Pace microprocessor, as well as a static display of add-on memory systems for the IBM 170/145 and 158, will highlight National Semiconductor's display in booths 2305 and 2307, according to the firm at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

One With Microprocessor

Datatype Page Readers to Debut

Miniworld

At
NCC



Almost any CRT terminal can be connected to the unit, the firm said, permitting a variety of different modes.

The new DF-6 typing element prints a mark under each character which can be read by the Datatype 506 reader, the firm said from 1050 N.W. 163rd Drive, Miami, Fla. 33169.

With this hanger...

and this rack...

and any hanging tape you use...



Tab presents the most versatile tape storage yet devised!

We call it Tab Hang II. That's because this compact, new concept in hanging tape storage accommodates any type seal or cartridge with a hook in use today — and, for that matter, probably any in store for the future!

Spring loaded, plastic-against-plastic.

Basically, the system consists of a rack with polypropylene hangers that can be used in open, library storage, or in our Data Media Cabinets. The plastic hangers exert a spring-loaded effect

on the tapes — a tap of the finger swings a tape out so it is easy to grasp. The system allows side-to-side movement of the hangers, accommodating the varying width of hanging tapes.

The plastic hook on your tape mates with the plastic hanger, eliminating metal-to-plastic abrasion. Tab's new Hang II, a hanging tape storage system for all reasons!

Call your local Tab Products representative or write for information. Tab Products Company, 2690 Hanover Street, Palo Alto, California 94304.

NCC Booth #2635-2639

TAB
PRODUCTS CO

Kennedy Schedules First-Time Display Of 9100 Transport

ANAHEIM, Calif. — A first-time showing of its Model 9100 tape transport is planned by Kennedy Co. in booth 2117. The 10-1/2-in. reel, 75 in./sec vacuum-column tape transport uses a capacitive tape location detector to reduce tape wear and improve recording accuracy.

The transport reads and writes IBM and ASCII-compatible tapes. Typical applications are minicomputer and data collection systems.

Metallized Diaphragm

To provide linear tape position sensing, a metallized Mylar diaphragm serves as one plate of a variable capacitor which extends the complete length of the rear of the vacuum column. Pumping at the bottom of the column produces a negative 1 psi pressure below the tape and a negative



Kennedy Model 9100 Tape Transport

1/2 psi pressure above the tape.

The differential pressure displaces the diaphragm in proportion to tape location and provides a linear variable capacitance output.

The transport has a standard tape speed of 75 in./sec with speeds from 25- to 75 in./sec available on special order. The unit comes in 800 bit/in. or 1,600 bit/in. models. Kennedy said from 540 West Woodbury Road, Altadena, Calif. 91001.

Miniworld

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PDI Announces Entry Of 1000 Card Reader

ANAHEIM, Calif. — The Model 1000 card reader, which is Peripheral Dynamics, Inc.'s entry into the data collection field, will be featured in booth 2250, the firm said.

The unit is a single feed card reader designed to handle 22-column, 51-column and 80-column cards, the firm said, adding that it will cost \$600 in single quantities.

Peripheral Dynamics is at 1030 W. Germantown Pike, Norristown, Pa. 19401.

Systems Will Demonstrate SAC Graf/Pen, Coupler

ANAHEIM, Calif. — A variety of systems featuring the Graf/Pen sonic digitizer and the Model DC-6 data communications coupler will be in operation at Science Accessories Corp.'s (SAC) exhibit in booths 1250 and 1252.

The data systems demonstrated include a business data entry system, a strip chart analysis system, a system for interaction with a plasma display and a biomedical system for ventricular volume analysis.

For strip chart analysis, the firm will utilize its Model V-3 motorized chart viewer on which the Graf/Pen sensors are mounted. The data from the Graf/Pen stylus will be converted into digital coordinates by the Graf/Pen and then into punched paper tape by a punch incorporated in the system, according to the firm at Kings Highway West, Southport, Conn. 06490.

Printronix 300 to Be on View

ANAHEIM, Calif. — Printronix, Inc. will display the Printronix 300, a recently introduced, 300 line/min multicopy matrix printer, in booth 1358.

The unusual design is clamped to give the appearance of a solid font while providing the capability of precise character alignment available in a device of this type, the firm said.

Designed to meet the requirements of the expanding minicomputer systems market, the unit's price, including an interface converter with a printer and an electronic VFU, is \$4,695 in single quantities, the firm said from 17935 Sky Park Circle, Irvine, Calif. 92707.

Hydra to Show OEM Printer Line

ANAHEIM, Calif. — Hydra Corp. will introduce a series of OEM medium-speed printers in booth 2110.

The first in the line is the Model B, a 180 char/sec matrix printer.

The Hydra ballistic print head, unlike other matrix printers, does not use solenoids with moving cores attached to the wires, the firm said. It uses simple electromagnets that activate small hammers which, in turn, ballistically propel the matrix wires.

Small Circle

With the wires independent of the coils, the driving ends are engaged in a small, centrally located circle.

The character style of the Hydra printer is 9 by 7 dots/mm, for a total of 63 dots available for each character formation. Two of the nine wires are below the normal print line, permitting the printing of both upper- and lower-case English characters, as well as foreign alphabets such as German, Arabic and Japanese

Kana, the firm said from 2218 Old Midfield Way, Mountain View, Calif. 94043.

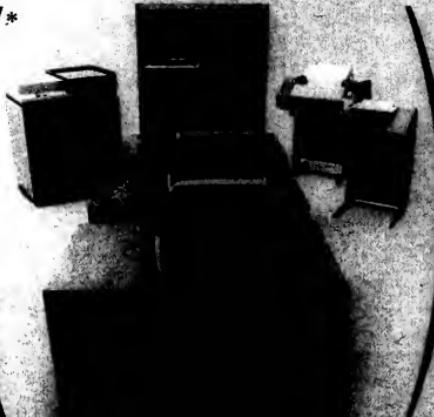
Randomex to Exhibit Four Disk Cleaners

ANAHEIM, Calif. — Four disk cleaners will be shown in booth 1455 by Randomex, Inc., with particular attention on the 515 and 535 disk cartridge cleaners, which are said to be capable of cleaning over 95% of the disk cartridges presently in use.

The 535 is for cleaning the IBM 5440-type cartridge among others, the firm said, noting that both it and the 515 permit cleaning without dismantling of the cartridge's plastic case.

The firm is at 27303 Warrior Drive, Palos Verdes Peninsula, Calif. 90274.

**GREAT
COMPUTER
SECRETS**



GCS 2100 COMPUTER SYSTEMS

Telefile to Launch First Voyage Of Its DC-16-C Disk Controller

ANAHEIM, Calif. — A disk controller will be introduced by Telefile Computer Products, Inc. in booths 1111 and 1113.

The DC-16-C will be offered along with any of the firm's disk drives, enabling the creation of a disk storage system with a capacity of 27.3M bytes to 940M bytes.

The system can be used with the Digital Data Corp. 1700 Series; the Digital

Facit-Addo Showing Printer

ANAHEIM, Calif. — Facit-Addo, Inc. plans to show its Model 4515 serial page printer with a printing speed of 60 char./sec as part of its exhibit in booths 2734, 2736 and 2738.

The unit is available with parallel interface or serial interface, the firm said from its headquarters at 501 Windsor Drive, Secaucus, N.J. 07094.

Equipment Corp. PDP-11; the Honeywell H-16; the Hewlett-Packard 2100 series; the Interdata 50, 70, 74, 80, 85, 7/16, 7/32 and 8/32; the Lockheed Sue and Mac 16; the Data General Nova 800 and 1200; and the Varian V-70 series.

Handles Four Drives

Priced at \$5,500 per controller, a system can cost under \$11,000, the firm said.

The unit can handle up to four disk drives in the standard configuration, but an option allows it to go to eight drives while the data transfer rate is either 806 kbytes/sec or 1,209 kbytes/sec.

There are nine operational commands and two status registers with the system, Telefile said from 17131 Daimler St., Irvine, Calif. 92705.

For the past four years we've been developing our powerful GCS 2100 system and building its software, support and service program. And we've never taken the time to tell enough people what a great system it is.

How efficient it is (average of 80% reduction in errors—35% to 85% faster document handling).

How reliable it is (less than 1% downtime). How simple it is (operator training time less than 8 hours).

Or how economical it is (10%—40% savings in data preparation costs).

And our competitors have loved us for keeping it such a secret!

The GCS 2100 is a complete data entry system it lets you collect and edit data at the source (data is actually edited while it is being keyed).

Store the data on disc. Then transfer the clean data to an output media like magnetic tape.

(Conversely, data already on tape or cards can be re-submitted to the GCS 2100 for editing, reformatting, etc.)

By editing input data before it goes to disc storage, the GCS 2100 lets you quickly spot errors that could have become costly.

The GCS 2100 can interface up to thirty-two Touch-Tone® telephones, Card readers, Medium and high speed line printers, Four-tape drives, Four fixed or moving head discs.

All on a single system.

The GCS 2100 provides extensive I/O functions that allow you to transfer data to and from disc storage and other I/O devices, and to add an add-on terminal for comprehensive statistical reports and monitoring of the system and the operator's performance), all with minimum impact on a supervisor's time.

The GCS 2100 can accommodate up to 64 local or remote terminals: local terminals can be located up to 2500 ft. from the system's CPU. You get faster, more accurate data entry for functions like payroll, shipping, receiving and manufacturing, because the person most familiar with the data does the keying. (Note: we can supply a typewriter keyboard and a special CRT format so this person doesn't have to be a keypunch operator.)

In addition to data entry from local terminals, the GCS 2100 offers data entry from remote terminals (it can handle up to five remote terminals over one dedicated telephone line); Touch-Tone® data entry, remote batch communications, and word processing.

A Programmable Extension Package (PEP) extends the power and the flexibility of the 2100 system: up to 255 PEP tables provide capability for automatic data insertions, range and value checks, table look-up, logical tests, character conversion and operator keys S.D., South Dakota is generated on output); and automatic format switching.

And because these tables are not job assigned, they can be used on several different jobs. (Note: no programming experience is needed to work with PEP.)

A library of over 100 common special edits is also available. It handles things like field relocation, special branching routines, manipulation of constants, and output editing requirements. (If there isn't an edit for your needs, we can design one.)

The GCS 2100 also provides up to 99 format levels per job, up to 255 balance accumulators; variable length record and block size factors; and up to 255 jobs stored in the system.

GCS DataTel: provides remote batch communications capabilities between the GCS 2100 systems and other 2780-compatible terminals and mainframes. And since the batch transmission of data is directly from disc to another mainframe, the usual step of transferring data to tape can be eliminated.

GCS DataTone: is a low-cost, efficient and convenient method for collecting numeric data from remote sites. It is designed for updating inventory, shipping documents, orders, etc.

DataTone answers automatically and handles up to thirty-two incoming lines at once.

With DataTone, the GCS 2100 system can accept incoming telephone data without intervention from the terminals.

GCS DataText: is a multi-purpose shared-processor approach to word processing. Designed for high-volume typing requirements, it is a fast, efficient, low-cost method for producing customized letters, envelopes, forms, labels and reports.

And since DataText uses a disc library, manual handling of storage media like cards, cartridges, etc. is eliminated.

If you'd like to get in on more Great Computer Systems, contact Agent 2100 at General Computer Systems, Inc., 16600 Olden Park, Addison, Texas 75001. (800) 527-2569 toll free. In Texas (214) 233-5800.

Miniworld

At NCC



Talos Unveiling Two Cursors

ANAHEIM, Calif. — Talos Systems, Inc. will unveil one-and four-button cursors for its Cybergraphic digitizer line in booths 1350 and 1352.

A magnification option is available for both work. Both models come with a hand-held stylus and both are directly interchangeable with stylus or pen assemblies in Talos' Cybergraphic digitizer and digitizer systems.

Price for the one-button cursor is \$200 and \$250 for the four-button model, the firm said from 7311 E. Evans Road, Scottsdale, Ariz. 85260.

Dataram Corp. Plans To Raise the Curtain On Five Memory Units

ANAHEIM, Calif. — A 32K by 20 bit single-board core memory and four 16K single-board memory systems will be introduced by Dataram Corp. in booths 1260 and 1262.

The DR-103 32K system features 750 words of memory and 320 msec access time, the firm said, adding that the unit would be priced at less than \$5/bit.

The four 16K-bit systems offer expansion memory for the Data General Nova 2 series, the Digital Equipment Corp. PDP-8 and -10, and Interdata's models 50, 70, 7/16 and 7/32.

The single-board systems are designed to plug in directly with the host systems, the firm said from Princeton-Hightstown Road, Cranbury, N.J. 08512.

Total Eclipse

ANAHEIM, Calif. — Data General (DG) will feature the theme "interactive systems" with an all-Eclipse exhibit in booth 1335.

The first of the new systems on display will be the Eclipse S/300 commercial system, operating with Infor data base-oriented file management software.

In addition, an Eclipse S/200 will be demonstrated as a Haip workstation and a second Eclipse S/200 will be seen controlling a real-time sensor-based operation.

Printer With Options To Star at Okidata

ANAHEIM, Calif. — An expanded version of the Okidata 110 char./sec printer and an alphanumeric panel display will be shown in booth 2629 by Okidata.

The newest model of the CP10 printer features optional tractor feed and upper-and-lower-case ASCII characters. The unit prints 80 columns of 5 by 7 dot matrix characters at 110 char./sec or 70 line/min and costs less than \$900 in OEM quantities.

The panel display is an alphanumeric display in green, in addition to the firm's previous red display.

The firm will also show its line of double-density disk drives with capacities up to 36 Mbytes and its line of card readers that operate at speeds of 300-, 450- and 600 card/min. Okidata said from 111 Gaither Drive, Moorestown, N.J. 08057.

Tennecomp Datapacer Set

ANAHEIM, Calif. — Tennecomp Systems, Inc. will show its Datapacer cartridge tape system, which is compatible with the Digital Equipment Corp. PDP-8 and PDP-11.

The unit uses the 3M cartridge and can store 2.8M bytes per 44-track cartridge. Three drives are contained in a 19-in. rack.

The unit reads and writes at 30 in./sec with a transfer rate of 48 bit/sec while storage is done at 10 char./sec. DEC-compatible software is available for the system, Tennecomp said from 795 Oak Ridge Turnpike, Oak Ridge, Tenn. 37830.

Perforator Mechanisms on Display

ANAHEIM, Calif. — The EP series perforator mechanism will be displayed for the first time in booth 2265, according to its vendor, Data Specialties, Inc.

The unit has a die block life of 120M characters or 1,000 rolls, the firm said, and operates up to 30 char./sec asynchronous.

The firm is at 1548 Old Skokie Road, Highland Park, Ill. 60035.

GCS 2100
general computer systems.™

ASC Display to Use Intel 8080 In Controller, Microprocessor

ANAHEIM, Calif. — Two products using the Intel 8080 microprocessor will be displayed by Applied Systems Corp. (ASC) in booth 2301.

The ASC communications controller

Time Code Generator Model

Planned for Datum Exhibit

ANAHEIM, Calif. — A ruggedized time code generator (the Model 9150-006) will highlight the Datum, Inc. exhibit in booth 2316.

The device generates a serial time code format for tape recorder input, serial pulse train for system clock and sync pulses and parallel data for digital system requirements, according to the firm at 1305 S. State College Blvd., 92806.

uses the microprocessor configured with multiple interrupts to control one or more tape recorders. The unit communicates at rates up to 9,600 bit/sec.

A binary synchronous communications option is available to allow communication with IBM BSC systems using RS-232C compatible modems. The data transmission conventions may employ ASCII, EBCDIC, transparency or conventional modes, the firm said.

The ASC 8080 microprocessor was designed for custom implementation, was designed for severe environments. The unit features field-reprogrammable read-only memory and compatible random access memory for laboratory and airborne applications, the firm said from 26401 Harper Ave., St. Clair Shores, Mich. 48081.

ANAHEIM, Calif. — A modern computer compatible with Bell 202 data sets which features a digital filter system will be exhibited by Timplex, Inc. in booth 2620.

The digital technique is said to improve performance at 600- and 1,200 bit/sec and permit communications between 202s at 1,800 bit/sec over unconditioned or switched network lines or at 2,000 bit/sec over C2-conditioned private lines, the firm said.

Among the available options — all field-installable — are a synchronizer for synchronous data transmission, a

5- or 150 bit/sec reverse channel, a four-wire polling system, remote loop-back, a 16-bit digital switchable network interface (rs232c permitted).

The Timplex 202-Compatible Modem is available either as a single stand-alone unit in a small cabinet with integral power supply or as a card for insertion in an enclosed rack which holds up to 26 modems (Bell 103s, 202s or calling units) with either single or redundant power supply. Prices start at \$205, the firm said from 214 Franklin Ave., Midland Park, N.J. 07432.

Timplex Modem on Stage

ICP to Announce Three Products

ANAHEIM, Calif. — International Computer Products, Inc. will announce three new products in booth 1133.

The Baudwriter converts from 110- to 300 bit/sec to 1,200 bit/sec and up, the

firm said, by storing data for high-speed transmission from low-speed terminals. The unit is priced at \$144.

An all-weather point-of-sale device to capture data on a cassette tape, the V-71, is a ruggedized unit which is portable, the firm said, adding that each cassette could typically handle 6,000 transactions. The unit is priced at \$1,195.

The final product is the PI-71 digital

Terminals

At

NCC



cassette tape deck that operates in asynchronous incremental mode at 0- to 25 bit/sec and at 0- to 40 bit/sec in the synchronous incremental mode.

In the synchronous block mode, the unit operates at 100 byte/sec for a price of \$1,295, and at 1,000 byte/sec in read/write mode, according to the firm at P.O. Box 34484, Dallas, Texas 75234.

Pertec Transports Get First Showing

ANAHEIM, Calif. — The Peripheral Equipment Division of Pertec Corp. will exhibit for the first time its recently announced T9000 series vacuum column tape transports in booth 1429.

The Pertec T9000 is a 10-1/2-in. reel transport that is IBM- and ANSI-compatible. It is available in a full range of standard models with tape speeds from 25 to 75 in./sec and data transfer rates up to 120K char/sec.

Standard configurations for the T9000 series tape drives include 7- or 9-track NRZI, 1,600 char./in. phase-encoded (PE), an optional electronically switched dual format NRZI/PE and special multidensity read-only modes.

A 1.25-in. vacuum column which uses a low-speed vacuum pump and a "soft-field" enclosure around the pump results in quiet operation and extended life, the firm said from 9600 Irondale Ave., Chatsworth, Calif. 91311.

Telenet Will Demonstrate Packet-Switched Service

ANAHEIM, Calif. — Telenet Communications Corp., a specialized common carrier, will demonstrate its first public packet-switched data communications service in booth 1405.

Network service will initially be available from packet-switching exchanges installed in Washington, D.C., New York City, Boston, Chicago, Dallas, San Francisco and Los Angeles, the firm said from 1666 K St. N.W., Washington, D.C. 20006.

Shukan opens the door to the ever-expanding Japanese market.

The burgeoning Japanese computer market is the place to be, and Shukan Computer is the advertising vehicle to get you there. Japan is the second largest EDP market in the world, and the fastest growing. And according to the U.S. Department of Commerce, Japanese imports of EDP equipment will grow at a rate of 30% annually through 1977, while total imports will exceed \$1 billion per year. The U.S. share of this market should remain constant at 55%, although in previous years the U.S. share has reached as high as 70%. The minicomputer market is expected to chart a phenomenal 60% annual growth rate through 1977, while independent peripheral equipment sales will rise at a 44% rate. And the market potential for U.S.-manufactured communications terminals is great, according to the U.S. Department of Commerce, because the U.S. equipment is technologically superior to that being manufactured in Japan.

Shukan Computer, Computerworld's sister publication in Japan, is a joint venture of Computerworld and the leading electronics publisher in Japan, Dempa Publications. Shukan is the only newsmagazine for the computer community in Japan and with the combined resources of the two companies, it has the largest news gathering organization of its kind in the world.

Japanese businessmen read more than their American counterparts, and they place a greater value on the advertising they read. Buying decisions in Japan — unlike the common American system of one man, "EDP Manager" — control — are reached through development of consensus between several levels of operating management, including programmer and analyst levels. And Shukan goes to all these important buying influences. 23.5% of total circulation goes to Data Processing Management, 15.5% to Corporate Executives, and 27.9% goes to Professional Staff in the computer industry.

It's easy to advertise in Shukan. For a small surcharge, Shukan will translate your ad from English, set type, prepare a new mechanical and make a plate (rotary letterpress production). And with Computerworld representatives across the U.S. to assist you, you needn't go further than contact your area Computerworld salesman to place space in Shukan.

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If you'd like to know more about the Japanese market, we'll be glad to send you a free copy of our report "EDP Marketing in Japan". Just send in the coupon below — or contact your Computerworld representative.

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8800 'Super Disk,' Mag Tape Subsystems Part of STC Exhibit

ANAHEIM, Calif. — Storage Technology Corp. (STC) will exhibit equipment from its 8000 series disk family and its 3400 and 3600 series of magnetic tape subsystems in both 1129.

The 8800 Super Disk module has a storage capacity of 800M bytes. The disk's subsystem is a quad pack consisting of four disk packs, the quad pack. It is accessed by the arc actuator — a central shaft controlling multiple arms and heads. The module is program-compatible with IBM 3330 software.

STC's single-spindle 8100 disk module, which uses a single disk pack, is a 1.2M byte, 3334-1, will also be featured.

The 8000 disk control unit and the 8001 control module, required for attaching the single-spindle module, will also be shown.

Tapex products on display will include the Model 3470 and 3670 tape drives. The 3470 records at 1,600 bit/in. and



STC Model 3670 Tape Drive Unit

the 3670 records at 6,250 bit/in.

STC's 3340 disk module, which operates in a group-coded recording mode at 6,250 byte/in. or phase-encoded mode at 1,600 byte/in., will also be on display.

The company is at 2270 South 88th St., Louisville, Colo. 80027.

Japan Vendor Flying in Drives

ANAHEIM, Calif. — Nippon Peripheral Ltd. will show its Model NP20 disk drive and Model NP21 data module in booths 1153 and 1154.

Random access memory units, the NP20 and NP21 are said to be plug-compatible with IBM 3340 drives and 3348 modules respectively.



Nippon Peripheral Drive Unit

The vendor noted diagnostics on the disk drives are accomplished by inserting microprogram in the controller. The data module is closed, accommodating the disk, head, carriage and spindle, the company added.

Currently available for OEM sales in the overseas market, the devices can be obtained from Nippon at 2039-93 Okuda Building, Kogenuma, Fujisawa-shi, Kanagawa-ken, 251 Japan.

CRU Meter to Make Showing

ANAHEIM, Calif. — CRU, a subsidiary of Computer Resources, Inc., will demonstrate its capacity meter in booth 2263.

The unit, designed for IBM 370/135 and up computer systems, is a measurement device that signals when storage falls below predetermined loading levels.

The unit is priced at \$4,500, the firm said from 4650 W. 160th St., Cleveland, Ohio 44133.



T/S Plotter Controller To Highlight HI Booth

ANAHEIM, Calif. — A time-sharing plotter controller and a magnetic tape controller will be the highlights of the Houston Instrument display in booth 2717.

The PTC-5 plotter-controller drives any Complot plotter, the firm said, adding that the unit has firmware character, vector generation and a circular buffering system.

The MTR series of phase-encoded tape reader controllers operate at 1,600 char./in. and range in price from \$16,750 to \$19,950, the firm said.

In addition, Houston will display the 700 line/min chain printer, said to be 50% faster than the DP-100 plotter. It is a 150 step/sec. and operates on-line or off-line for a price of \$3,500, the firm said from One Houston Square, 8500 Cameron Road, Austin, Tex. 78753.

700 Line/Min Chain Printer For S/3 Prime DAC Feature

ANAHEIM, Calif. — A feature of the Digital Associates Corp. exhibit in booth 1665 will be the 700 line/min chain printer now being delivered to IBM System/3 users.

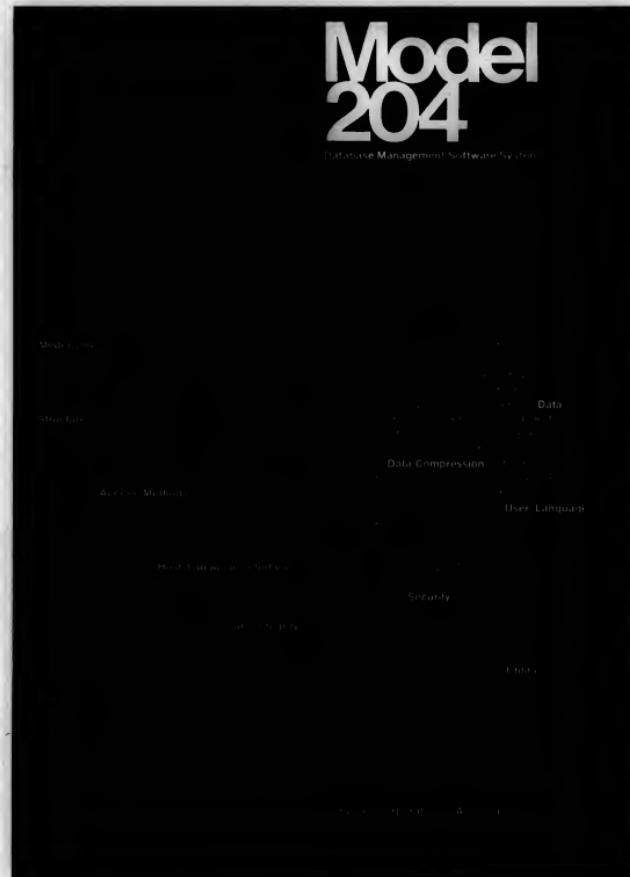
The unit features a full 48-character IBM-compatible chain, heavy duty paper tractors above and below the print station, as well as built-in test circuits and a LED diagnostic panel.

This unit is offered for sale at a purchase price of \$25,600 or \$675/mo on a three-year lease. Digital Associates is at 24 Old King Highway South, Danbury, Conn. 06820.

PPI Power Converter to Debut

ANAHEIM, Calif. — A solid-state power frequency converter will be introduced by Power Conversion, Inc. in booths 1211 and 1213.

The system 475 is for applications requiring 400 Hz power and the maximum power is 75 KVA, the firm said from 141 Jefferson Drive, Menlo Park, Calif. 94025.



With 90 Sessions in 18 Areas in Four Days...

ANAHEIM, Calif. — The 1975 National Computer Conference session coverage has been broadened to include sessions falling under the category of "Interaction With Society." In addition to the previous topics of "DP Methods and Applications" and "Science and Technology."

Conference chairman Donal A. Meier and technical program chairman Stephen W. Miller have planned the schedule to include 18 areas of interest, consecutive, rather than concurrent, sessions in their area of interest in the same location at the convention center here.

The four-day conference, beginning May 19 and ending May 22, will feature 90 sessions in 18 areas, as well as several special events.

Areas identified under the topic of "Interaction With Society" include "Education-Curricula-Training," "Making Computers Safer," "Legal Aspects of Computer Management" and "International Dialogue."

In the science and technology area, special emphasis will be placed on the impact of technology on medical, industrial, management controls, operational systems and cost-effective computer usage. Science and technology will encompass sessions in eight areas ranging from micro-

processors to software, storage technology and forecasting DP.

"Methods and Applications" will center on "the use of cost effectiveness of a system or portions thereof, focusing on topics of concern to management."

The six areas grouped under the heading of "Methods and Applications" will range from user views and requirements to management, health care, banking and "innovative applications."

Of the 15 sessions in the overall area of "Interaction With Society," four of Tuesday's sessions on education will examine whether education is meeting industry's needs with views from both sides, as well as a look at how programs benefit from interaction and cooperation.

Two other sessions will treat DP education for students majoring in other subjects as well as computer-assisted instruction.

Also on Tuesday, four sessions will examine "Making Computers Safer" through technology, licensing and other alternative methods, good practices and audit.

On Wednesday, attendees interested in "Legal Aspects of Computer Management" will hear speakers cover aspects ranging from legal responsibilities in buy-

ing, using and selling DP equipment to antitrust and regulatory aspects, as well as possible changes that may occur in order for law to meet the needs of the computer industry.

The Wednesday sessions on international dialogue will center on communications such as packet switching and interface standards.

An overview of special events appears on Page 64.

Under the aegis of "Methods and Applications," several sessions will focus on user needs and views.

Two sessions on user requirements will present the two sides of the issue, both from an industry perspective, development, followed by a panel of users and manufacturers addressing the issue of technology transfer.

The four sessions on users' viewpoints on DP will highlight sound management controls and procedures and data security and privacy.

Attendees will hear discussions on optimizing the computer installation, data security and personal privacy, managing new programming technologies and selecting data base management packages.

The four Wednesday sessions on health care and computers will feature a look at what went wrong with the medical information system, as well as a look forward to future directions in medical computing.

There will also be sessions on computer applications in ambulatory care as well as medical information systems.

Tuesday's banking sessions will cover topics ranging from electronic funds transfer systems to back-office problems and approaches to solutions. Other aspects of technology as applied to banking, such as communications-based systems and data bases, will also be examined in depth.

Under the heading "Management and Computer," two sessions will deal with the perspective of a DP executive and a user executive, while a third will look at management issues in computers—such as long-range planning and cost benefit evaluation of interactive transaction processing.

Sessions coming under the heading of "Innovative Applications" will cover topics such as medicine, education, automation and "Knowledge-based expert systems," which are defined as those hav-

(Continued on Page 51)

MONDAY afternoon		TUESDAY morning		TUESDAY afternoon		WEDNESDAY	
2:00 p.m.-3:40 p.m.	3:50 p.m.-5:30 p.m.	8:15 a.m.-9:55 a.m.	10:05 a.m.-11:45 a.m.	2:00 p.m.-3:40 p.m.	3:50 p.m.-5:30 p.m.	8:15 a.m.-9:55 a.m.	
Santa Ana Room							
1. National Centers for Scientific Computing — G. Stuart Peterson Jr.	6. Alips Programs — Paul W. Bartholomew	11. Microprocessor Basics — Rob Walker	17. Microprocessors at Work — Paul M. Russo	23. Bipolar Microprocessors — Theodore A. Leontis	29. Microprogramming and Microcomputer Programs — Herut Bernstein	37. Tutorial and Panel Discussion on Relational Data Base Management — Edgar F. Codd	
Calif. Room							
2. Programming as an Art of Communication — Robert Barton	7. Software Portability and Reliability — David B. Worman	12. Programming — Art, Science or Engineering? — Brian W. Kernighan	18. Issues in Programming Language Design — Anthony J. Wasserman	24. Cobol '74 — Its Impact on Software Engineering — Paul Oliver	30. Software Engineering — Thomas E. Bell	38. Operating Systems Theory — R. Stockton Gaines	
Garden Grove Room							
3. Graphic Models of Physical Systems — Charles M. Eastman	8. Economics of Computer Graphics Systems — Ira W. Corrigan	13. Electronic Funds Transfer Systems: What's In It for You? — B. Ray Trawick	19. Applications and Applications of Communications-Based Systems Technology on Banking Operations — Larry Dorf	25. Banking's "Back Office" Paper Problems and Approaches to Solutions — Werner M. McKee Jr.	31. Data Base Technology in the Banking Industry — Bernard K. Plogman	39. Optimizing the Computer Environment — Leo J. Cohen	
Calif. Room II							
4. Developer and User View of User Requirements — Richard G. Mills	9. Technology Transfer: Shouldering National Issues — Richard G. Mills	14. Making Computers Safer Through Technology — Edward Nease	20. Making Computers Safer Through Licensing, Certification or Professional Responsibility — Oliver R. Smoot	26. Making Computers Safer Through Good Practices — Bruce Gluckhardt	32. Making Computers Safer Through Auditing — William E. Perry	40. Legal Responsibilities in Buying, Using and Selling Data Processing — Robert P. Bigelow	
Calif. Room III							
5. Information Processing: Its Impact Upon Society Through Library Systems — Susan Crowe	10. Computing Applied to Social Problems — Donald L. Thomsen Jr.	16. Data Processing — A View from Education — A Response from Industry — Thomas J. Carkman/Gary B. Shelly	21. Future Prospects in Data Processing-I — Earl C. Joseph	27. Future Prospects in Data Processing-II — Siegfried Trub	33. Advances in Computer Technology Through Aerospace Requirements — Richard H. Thayer	41. Enhancing Storage Reliability by Sophisticated Coding Schemes — Jack Moshman	
Calif. Room IV							
Anaheim Room							
KEYNOTE ADDRESS 10:00 a.m. — Anaheim Room Speaker: Prof. Jay W. Forrester, MIT							
CONFERENCE LUNCHEON 12:00 p.m.-1:45 p.m. — Anaheim Room Speaker: Milt Gorshow, Sperry Univac		CONFERENCE LUNCHEON 12:00 p.m.-1:45 p.m. — Anaheim Room Speaker: Milt Gorshow, Sperry Univac		CONFERENCE LUNCHEON 12:00 p.m.-1:45 p.m. — Anaheim Room Speaker: Milt Gorshow, Sperry Univac		CONFERENCE LUNCHEON 12:00 p.m.-1:45 p.m. — Anaheim Room Speaker: Milt Gorshow, Sperry Univac	
SPECIAL SESSION 8:00 a.m.-10:30 a.m. — Anaheim Room I The Editors Speak Out, Look — Jan F. Brendza		SPECIAL SESSION 8:00 a.m.-10:30 a.m. — Anaheim Room I The Editors Speak Out, Look — Jan F. Brendza		SPECIAL SESSION 8:00 a.m.-10:30 a.m. — Anaheim Room I Data Processing in 1980-1985, Ted Dornte		SPECIAL SESSION 8:00 a.m.-10:30 a.m. — Anaheim Room I Data Processing in 1980-1985, Ted Dornte	

...Time Will Never Hang Heavy for NCCers

(Continued from Page 50)

ing expertise in some domain, able to utilize their understanding to facilitate the formulation, expression and solution of problems within that domain.

Sessions in the technical area span all four days.



Attendees at the four sessions on microprocessors can experience a tutorial of LSI micros as well as discussions of applications.

A session on bipolar micros will be followed by a concluding session on microprogramming and microcomputer programming.

In computer communications networks, the sessions will update attendees on the

current status of networks in anticipation of the other meetings on packet switching and packet radio.

Software Sessions

Eight sessions devoted to software will begin Monday morning and end Wednesday evening, making this one of the subjects covered most in depth.

Sessions will vary from "Programming as an Art of Communications" or "Can You Read Your Neighbor's Program?" to a look at Cobol '74 and its impact on software engineering.

Emphasis throughout the sessions will be on the development of tools and techniques leading to cost-effective specification and production of reliable computer programs.

Several approaches to storage technology will be featured during the four Wednesday sessions on that topic, ranging from using terminals to program storage devices as well as a new approach. A concluding session will center on systems applications of new storage technology.

Thursday will see sessions in the areas called "Interaction of Technology" and "System Architecture." These will look at hardware advances that can be expected to impact software, system pro-

ductivity and ease of use. Specific topics include multiprocessor structure, storage hierarchy, structure and control, firmware primitives for data base applications and software architecture for memory and data management.

The Monday evening sessions on interactive graphics will summarize the latest advances for end users.

"Forecasting DP" on Tuesday will cover topics such as microprocessors, distributed function networks, dedicated systems and operating systems as well as forecasts.

DATA BASE MANAGEMENT

Data base management, which is "in a state of ferment" as a result of new requirements, will be examined in seven sessions on Wednesday and Thursday.

Among these new requirements, explained director Edgar F. Codd, are the need for more powerful languages and terminal activities more independent of the internal representation of data in storage and the need to support:

- Different kinds of end users and interactions at terminals.
- Enhanced data security and privacy.
- Increased dynamic sharing of data.
- Networks of mutually remote data

bases.

Primary emphasis will be placed on relational data base management, which has not been previously examined at an NCC, he said.

The first session will deal with an explanation of this approach as well as a panel discussion on major problems in implementing relational data base management systems.

The panel will also examine if there is any necessary loss of performance if performance-oriented access paths are known to the system, but not to the application.

The other six sessions will be based on submitted papers. Topics include examining the differences between hierachic and non-hierachic data structures as well as relational data base technology, in which the system selects efficient retrieval algorithms.

Another session will deal with the human factors pertaining to query languages.

One session will examine performance evaluation, data compression, which includes a survey, and binary search trees.

The final session will deal with distributed data bases in the medical field and urban management.

morning	WEDNESDAY afternoon	THURSDAY morning	THURSDAY afternoon
10:05 a.m.-11:45 a.m.	2:00 p.m.-3:40 p.m.	3:50 p.m.-5:30 p.m.	8:15 a.m.-9:55 a.m. 10:05 a.m.-11:45 a.m. 2:00 p.m.-3:40 p.m. 3:50 p.m.-5:30 p.m.
DATA BASE MANAGEMENT			
44. Data Base Machines — Michael M. Hammer	51. International Data Base Implementations — David M. Dehm	59. Government Funding in Computer Science — Kent K. Curtis	66. Relational Data Base Technology — Dennis W. File
FUNDING II			
72. Assembly Languages and Comparative Evaluation — Ben Schneiderman	78. Performance Evaluation — Dan Compton and Search — E.E. Lindstrom	84. Distributed Data Bases and Applications — Eugene I. Lowenthal	
DEVELOPMENT			
45. Program Verification in 1980 — Ralph L. London	52. Workload Characterization — Kenneth W. Kot	60. Psychological Research on the Use of Computer Languages — James H. Carter	67. Computer Communications: Who, What, Where, When, and Why — How and Frank
COMPUTER-COMMUNICATIONS NETWORKS			
73. Advances in Packet-Switching — David C. Walden	78. Advances in Packet Radio Communication — Harry L. Van Trees	85. Packet Radio: Future Impact — Robert E. Kahn	
MANAGEMENT AND COMPUTERS			
46. Issues and Answers — Data Security and Personal Privacy — James A. Case	53. Managing the New Programming Technologies — Dan Mohr	61. Selection Techniques for Packaged Date Management Systems — Hans-Ulrich Ulrich	68. A Managerial Perspective of the Evolution and Future of DP: A User Executive View — John F. Rockart
62. Future Trends in the Law of Computers — Susan H. Nyquist	63. Computer-Aided Manufacturing — Tony C. Woh	74. A Managerial Perspective of the Evolution and Future of DP: A User Executive View — John F. Rockart	80. Management Issues in Computers — John J. Donovan
LEGAL ASPECTS OF COMPUTER USE			
54. Legal Aid for EDP Managers — Computer-Related Tax, Recordkeeping, Insurance and Labor Questions — Roy H. Freed	64. Computer-Aided Manufacturing — Tony C. Woh	75. New Applications in Printing and Publishing — Joseph J. Guitars	86. Design and Implementation of Distributed Systems — David J. Ferber
APPLICATIONS			
47. Antitrust and Regulatory Aspects — F. Sherwood Lewis	55. Advances in Novel Storage Technologies — John C. Davis	65. System Implications of Advancing Storage Technology — Jerome H. Saltzer	81. Computer System Simulation and Performance Evaluation — Hans Kasper
70. Impact of New Technologies on Computer System-Architecture — Gerald Estrin	76. New Advances in Processor-Memory-Switch Architectures — Stuart E. Madnick	82. Date and Memory Management Architectures — Jeffrey P. Buzen	87. Date Bases in the Humanities — James Joyce
INTERACTION OF TECHNOLOGY AND ARCHITECTURE			
48. The Mass Storage Impact — John R. Morrison	56. Advances in Novel Storage Technologies — John C. Davis	71. Innovative Applications of Computer Science in Medicine — G. Anthony Gory	88. Panel Discussion on Technology and Architecture — Richard P. Case
66. Future Directions in Medical Computing — Marlene S. Biles Jr.	72. Innovative Applications of Computer Science in Education — Alan Kay	77. Innovative Applications of Computer Science in Automation — Richard L. Paul	
INNOVATIVE APPLICATIONS OF COMPUTER SCIENCE			
49. International Data Communication Policy — Alex Curran	57. The Impact of Computer Interface Standards — Thomas J. Althuk	78. Innovative Applications of Computer Science in Auto-mation — Richard L. Paul	89. Knowledge-Based Expert Systems — Norton R. Greenfield
67. Medical Information Systems — G. Octo Barnett	68. Interface and Software Standards — Japanese and European Viewpoints — Sami de Picciotto	79. Innovative Applications of Computer Science in Education — Alan Kay	
80. Computer Applications in Ambulatory Care — Carter Vassallo	85. Future Directions in Medical Computing — Marlene S. Biles Jr.	83. Innovative Applications of Computer Science in Automation — Richard L. Paul	
SPECIAL ADDRESS			
1:00 p.m.-2:00 p.m. — Andrew H. S. Chen	69. SPECIAL SESSION		
Speaker: The Honorable Jimmy Carter, Former Governor of Georgia	2:00 p.m.-3:30 p.m. — Orange County Room Pioneer Day		
INDUSTRY LUNCHEON			
		12:30 p.m.-1:45 p.m. — Anaheim Room	
		Speaker: Gov. John E. Sherron	



Announcing the start of a new era in business computing.

The DATASYSTEM 310 from Digital. A disk-based computer system for \$12,000.

Datasystem 310. One of the most remarkable business tools Digital or anyone else has ever designed.

Now you can own a disk-based computer system at a price that seems all but impossible. \$12,000 purchased. Under \$300. a month leased.

So warehouses, insurance companies, large EDP users, banks, and companies with many branch offices may find the 310 the most important new system in years.

It includes a PDP-8A CPU with 16K characters of core memory, a VT50 CRT (960 character display) with full keyboard and numeric keypad, operating software, and a dual floppy-disk drive to store 670,000 characters.

You can expand up to 64K characters of memory and up to 1.34 million characters of disk storage. You can add printers with speeds of 30 cps, 165 cps, or 300 lpm; and a 2780-compatible interface for communications.

COS 310 software provides tools to develop and run an efficient system. DIBOL language serves for higher-level business

programming, and a full complement of utility routines can handle file management and report generation.

To some users it will be the ideal RJE station. To others it will be a brilliant terminal at a cost lower than a smart one. For still others it will be the stand-alone computer system that goes anywhere. And whatever applications programs you develop for the 310, you develop only once. Since these programs will run on your other 310's or larger 300 series systems without reprogramming.

For all of these reasons it was designed to be bought by the dozens. Which is made easier by our volume discounts. It's a computer that costs less than most terminals, less than most calculators, less than most clerks. And it's complete. And completely backed up by Digital — manufacturer of the most, as well as the most reliable, minicomputers in the world.

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In Addition to Micro Modem

DTC Printer-Based Terminal Plans First Appearance

ANAHEIM, Calif. — Several new products — ranging from a table-top terminal to a terminal through a modem to a floppy disk communications system — will be announced by Data Terminals and Communications (DTC) in booth 2449 here.

The DTC-300 Model 3 table-top, 30 char./sec. Diablo print-

Six AJ Devices

To Make Debut

ANAHEIM, Calif. — Three terminals and three acoustic couplers will highlight the Anderson Jacobson, Inc. exhibit here in booth 7645.

Both the AJ 630 and the AJ 830 operate at 10-, 15- or 30

er-based terminal incorporates a read-only memory to control the printer, a magnetic dot matrix tab set and reset, bidirectional printing, graphics capabilities, super plot with variable pitch and line-feed spacing.

The features may be controlled from the Selectric-style keyboard or the communications line using standard ASCII escape and control codes, the firm said, adding that the unit is priced at

\$134/mo or \$4,500 purchase.

The firm's micro modem is said to be compatible with the above data couplers including the Bell 113 A and B, the Bell 103 A and F, data phones and so forth. The unit ranges in price from \$75 to \$250, the firm said.

The Micro-Flex flexible disk storage and edit system can be attached to any DTC terminal and offers off-line data entry editing, storage and retrieval. The

unit is capable of transmitting from the terminal at up to 4,800 bits/sec.

Incorporating the Shugart floppy disk, the system allows for storage and retrieval of data by file or line identification and average access time is said to be 5 sec./record.

Price is less than \$3,000, the unit is available from the firm at 1190 Dell Ave., Campbell, Calif. 95008.



DTC Micro Modem

Terminals



char./sec., but the 630, priced at \$155/mo, is a nonimpact unit, while the 830, priced at \$185/mo, is based on the IBM Selectric printing mechanism. It prints at 15 char./sec and comes optionally equipped with a portably carrying case.

Three of the firm's acoustic couplers — the A242, AD 342 and Adac 1200 — will also be on display as will the firm's entry in the modem field. The couplers are priced from \$21/mo to \$50/mo from the firm at 1065 Morse Ave., Sunnyvale, Calif. 94086.

MFE Model 5000

Has Three Functions

ANAHEIM, Calif. — MFE Corp. will introduce its Model 5000 data terminal in booth 2151.

Designed to function as a batch data terminal, a process reader or data logger, the terminal also employs a digital cassette recorder.

The vendor said the device features a storage of 145K char./cassette; RS-232-compatible I/Os with switch-selectable speeds of 110, 300, 1,200, or 2,400 bit/sec., or 100, 1,000 or duplex operation and a microprocessor buffer for maximum data transfer rates.

The Model 5000 is available from the company at Keweenaw Drive, Salem, N.H. 03079.

Exchange System Set

ANAHEIM, Calif. — McDonnell Douglas Electronics Co. will use booths 2501, 2503 and 2600 as the launching pad for a data exchange system which can provide a variety of services to a variety of terminal equipment.

The 1018 series can accommodate a wide range of CRTs and other I/O devices, the firm said, in addition to the Touch-Tone and voice-answer-back capabilities, the firm said from Box 426, St. Charles, Mo. 63301.

Inventory Control

Sales Order Entry

Accounts Receivable

Under Datashare control

- The Datapoint 5500
- 300 lpm printer
- 2 large disk units

General Ledger

Accounts Payable

Under Datashare control

- The Datapoint 5500
- 300 lpm printer
- 2 large disk units

For your total business

Has 2,000-Character Screen

Conrac Readies First in Line With Microprocessors

ANAHEIM, Calif. — The first in what is to be a line of terminals employing microprocessors will be introduced by Conrac

Corp. in booth 1267 here. The Model 480/25, which displays 2,000-characters in an 80-character by 25-line for-

mat, is based on a microprocessor that can be reprogrammed through the use of programmable read-only memory (PROM). The unit is fully teletypewriter-compatible and is available with full edit capability.

The unit operates at up to 9,600 bit/sec standard, but higher operating speeds are available as options.

Another option is the ability to

support up to four peripheral devices, including floppy disks or printers. In addition, 64K of random-access memory is available as an option.

The firm will also show its 401 adaptive terminal for polling configurations and its 480/8 TTY, which is a teletypewriter-compatible unit for under \$1,000 in quantity orders.

The new device is designed for the OEM customer, Conrac said, since all edit features and operat-

Remote Batch Units Showcased

ANAHEIM, Calif. — Cincinnati Milacron Co. will introduce three remote-batch terminals and a disk-based operating system for its line of minicomputers in booth 2447.

The terminals — the CIP/220, CIP/240 and the CIP/260 — are designed to operate with Control Data Corp., IBM and Univac

computers or operate as a multi-programmed, multiple-terminal mode under RJE-II, according to Cincinnati Milacron, Mason-Morrow Road, Lebanon, Ohio 45036.

Terminals



manufacturers, respectively, with the 220 operating under EXEC-PORT/IMPORT disciplines, the 240 operating under Hesp or ASP line disciplines and the 260 operating with 1100 series computers using Exec 8.

The basic configuration of the terminals includes a CIP/2200B microprocessor, 16K of memory, 16K of core memory, 600 card/line card reader, 65 line/min printer and a bisynchronous and modem controller.

Transmission rates of 1,200, 2,000, 2,400, 4,800 and 9,600 bit/sec are available. CRTs and a "no range" of peripherals are available, the firm said.

The disk-based operating system for the firm's line of min-

Practical Automation Showing Ticket Printer

ANAHEIM, Calif. — Practical Automation, Inc. will introduce the Model DMTP-5 programmable ticket printer at booth 1161 at NCC.

The unit will print up to 25 alphanumeric characters and symbols across the width of a standard multipart ticket.

Operation is said to be fully automatic, requiring only that the operator insert a ticket to the printer, where it is sensed, captured and motor-driven to an internal stop for printing and then ejected.

Data input is ASCII, the firm said, and the printing rate is approximately 2 line/sec with up to 32 lines per ticket.

The unit costs \$263, the firm said from Trap Falls Road, Shelton, Conn. 06484.

Cogar to Introduce 1503

ANAHEIM, Calif. — Cogar Corp., a subsidiary of the Singer Co., will be showing the Singer Model 1503 disk intelligent terminal system in booth 2357 and 2359.

While the firm's 1500 series was first introduced in 1973, Cogar will introduce the 1503 to U.S. users at the show.

Cogar is at Cosby Manor Road, Utica, New York 13502.

INTRODUCING THE FIRST MINICOMPUTER THAT CAN SUPPORT UP TO



The BTI 4000 series.

An entirely new line of minicomputer-based timesharing systems. Based on a new central processor, mass storage controller and communications processor. A major advance over the proven 3000 series.

With a revolutionary new idea.

A single 4000 system supports up to 32 concurrent users, with many new features for the system manager and user. But we didn't stop there. Up to eight 4000 systems can be "clustered" to allow sharing of central processor and disk storage facilities. That means as many as 256 users can access a clustered 4000 system—and to each user it looks like one system.

Start now. Grow later.

If 256 ports are too many for you right now, that's okay. Just start with a single system, or two, or exactly the number you want. And add more capacity as you need it.

BTI's 4000 system grows as you do—so you're never paying for more system than you want, or trying to get along with less system than you need.

Storage—lots of it.

Disk storage comes in 2.4 megabyte increments for smaller systems, and in 36 or 73 megabyte increments for the bigger applications. And if your needs are bigger yet, you can have almost 5 billion bytes of on-line storage on your 4000 system.

No hibernation.

You don't have to put a 4000 system to sleep to load or dump data, or to back-up your software. Selected portions or the complete contents of disk packs can be "mounted" or "dismounted" on-line. Files can be loaded from or dumped to magnetic tape on-line. And a SNAP back-up allows you to copy the entire contents of a disk pack for safekeeping, with individual user activity suspended for a few minutes.

BASIC-X.

The 4000's user language, a superset of BASIC, greatly extended for more user power in business and scientific applications. BASIC-X,



Conrac Model 480/25

From Lear Siegler

Compact ADM-3 Parading

ANAHEIM, Calif. — The ADM-3, a compact version of the ADM-1 terminal, will be shown for the first time by Lear Siegler, Inc., in booth 2348.

The unit has a 12-in. (diagonal) CRT screen and a 64-character display set in addition to a full-size keyboard. The standard display is 960 characters in 12 lines, and a 24-line version is available, permitting display of up to 1,920 characters.

In addition to the normal 53

keys, the terminal has the capability of generating up to 128 ASCII codes. Full- or half-duplex transmission may be selected with speeds of up to 19.2 kbit/sec.

RS-232 or current-loop interfacing is switch-selectable and the unit is equipped with an RS-232C interface.

The unit is priced under \$1,000 with OEM discounts available, the firm said from 714 N. Brookhurst St. here at 92803.

COMPUTERWORLD

Terminals

at

NCC



Vector Showing CRT Line

ANAHEIM, Calif. — Vector General will show its complete line of high-speed graphics terminals in booth 2615, the firm said from 21300 Oxnard St., Woodland Hills, Calif. 91364.

'Silent' Mini Bee 4 Set

To Buzz at Beehive Booth

ANAHEIM, Calif. — The Mini Bee 4 will be displayed in booth 1533 by Beehive Medical Electronics, Inc.

Operating at rates up to 9,600 bit/sec, the silent replacement for buffered teletypers features line and block transmission, addressable cursor, upper- and lower-case character generation, display operation in format or character mode and all teletype-writer-compatible codes.

The unit also has full-and-half-duplex on-line operation, RS-232C compatibility, 25 lines of 80-column display, line feed, carriage return and scrolling capability for a price of \$2,395 before quantity-order discounts.

Other Bees

The firm will also show the teletypewriter-compatible Mini Bee 2 priced at \$1,792, and the Super Bee 3, which operates as an operator-controlled pollable computer terminal with the capability to be a daisy-chain port for downstream polling. It is priced at \$3,695.

Beehive is at 670 W. 2600 South, P.O. Box 19244, Salt Lake City, Utah 84120.

Intershake Tester

To Bow at ARC

ANAHEIM, Calif. — Atlantic Research Corp. will use booth 1465 to exhibit its new data communications tester, Intershake.

The device simulates software, modems and terminals and can operate at speeds of up to 9,600 bit/sec. A built-in library of over 100 test functions includes polling protocols, trapping selected characters, logging characters in any position in the data stream and transmitting control characters.

Six Test Messages

Six test messages — Baudot, ASCII, EBCDIC, EBCD, Field Data and Selective code — are also included.

The unit is priced at \$7,490 from the firm at 5390 Cherokee Ave., Alexandria, Va. 22314.

Graphic Display Units

Focus of Imac Exhibit

ANAHEIM, Calif. — Imac Corp. will be exhibiting two interactive graphic display systems, which can operate either as remote terminals or free-standing graphics systems, in booths 2119, 2121, 2123 and 2125.

Graphics Display

The PDS-1G provides an intelligent graphics display terminal with fully programmable mini-computer.

The second system is the PDS-4 interactive graphics display system complete with mini-computer and 2D-image manipulation hardware, the firm said from 296 Newton St., Waltham, Mass.

Datalink to Perform

At Datron Exhibit

ANAHEIM, Calif. — Data Transport Co.'s (DTC) Models 2452 and 2454 will feature a display of the capabilities of the firm's Datalink data transmission service and the Datalink keyboard that can be used to attach to the system.

The specialized common carrier is at 8130 Boone Blvd., Vienna, Va. 22180.

TIMESHARING SYSTEM 256 USERS.

tell us you have a problem. In minutes, a time-share specialist can access and exercise your system over the telephone, just as if he were standing next to it. With the 4000's on-line diagnostic capability, all it takes is a phone call.

Available today.

Our new 4000 series multiprocessor systems aren't ideas waiting for an order to see if they'll work. They're available for a wide array of business, commercial and scientific applications. Like dealer inventory, entertainment ticketing, financial services, real estate transactions, word processing, engineering design, manufacturing control.

The 4000 system offers a high user/share capacity for a low cost of ownership, and can be a big money-maker for commercial timesharing firms, a big money-saver for in-house systems.

developed for BTT's 3000 series, now augmented for the 4000. BASIC-X has string arithmetic, providing extended precision for the accountant; a flexible file-handling structure with powerful features like non-interfering shared read/write access, and many other niceties that make the programmer's job easier and faster.

Uptime.

Because central processor and disk storage facilities can be deployed dynamically, you can pull a CPU or disk drive out of service for any reason, while maintaining system availability to all your users. Something to think about if your application can't tolerate any interruptions.

Fast, all-hours service.

24 hours a day, seven days a week, BTI service engineers are ready to help. Just call and

Representative Prices

Ports	Mass Storage (Megabytes)	Price
16	5	\$ 55,500
32	72	89,000
64	219	171,276
128	365	305,686
256	657	561,702

The BTI 4000 series Interactive Time-

sharing Systems. Call or write for details.

East: Cherry Hill, NJ (609) 795-2334

Midwest: Schaumburg, IL (312) 882-2111

West: Sunnyvale, CA (408) 733-1122

BASIC Timesharing

650 North Mary Avenue, Sunnyvale, CA 94086

See a 4000 at the Computer Caravan

Who'd dare introduce
a data system with
FORTRAN?



Only a company with a data system that has so much you won't care what its high level language is called.

Data General is the company. And the data system is the Eclipse™ C/300.

Eclipse C/300 is an on-line, multiterminal, interactive data system that extends and complements your present large computer system. A system you can actually afford to use for dedicated operational support.

It has a data base-oriented file system called INFOS™ that has all the conventional access methods: SAM, RAM, ISAM. Plus an unconventional method called DBAM (Data Base Access Method).

DBAM has such advanced features as data base inversion, dynamic space management, hierarchical key specification, partial records, generic and approximate keys, and relative position processing.

INFOS works with our Mapped Real-time Disc Operating System (MRDOS) which supports dual operations such as multiterminal on-line activity at the same time as batch processing or direct communication to other computers.

Our new, easy-to-use RPG II generates planned and unplanned reports.

You also get our re-entrant multi-tasking FORTRAN with full INFOS data manipulation capabilities that make it ideal for on-line multiter-

minal environments.

And to communicate with your 360/370, our multileaving, inter-leaving HASP emulates IBM's remote job entry workstation.

The computer is the state-of-the art Eclipse C/300. The one with 256K byte memory capacity, a comprehensive commercial instruction set, optional Error Checking and Correction (ERCC) that automatically corrects errors in main memory, and support for a mammoth 700 megabytes of on-line storage.

Yet a 96K byte Eclipse C/300 computer with ten million bytes of disc, line printer, 60K CPS tape drive, 2 CRT's and a synchronous communication adapter plus INFOS, RPG II, FORTRAN, MRDOS, Sort and Merge, HASP and utilities costs less than \$80,000.

Which is a language anyone should be able to understand.

- Send me the Eclipse C/300 brochure.
- Send me a sales engineer.
- Send me the brochure that shows how small computers can be dedicated to operational support.

NAME _____

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Data General

Data General Corporation, Southboro, Massachusetts 01772. (617) 485-9100. Data General (Canada) Ltd., Ontario, Data General Europe, 15 Rue Le Sueur, Paris 75116, France. Data General Australia, Melbourne (03) 82-1361/Sydney(02) 908-1366.

Cal Data, Odec Sharing Space Of Data 100 Remote Batch CRTs

ANAHEIM, Calif. — The Data 100 Corp. exhibit in booth 2321 will feature the Data 100 line of remote batch terminals (Cal Data) and Odec, both of which have been acquired by Data 100, as well as the Data 100 line of remote batch terminals.

In the Data 100 line, the Model 76 remote batch terminal will be displayed as will the remote keyswitch system recently developed for use in the firm's keyswitch system. The keyswitch allows the user to access the keyswitch system via the Direct Distance Dial network or leased lines and consists of a keyswitch table with integrated modem, a 256-character CRT and an IBM 029 keyswitch or Selectric keyswitch.

From Cal Data, the firm will be exhibiting the Cal Data 1 microprogrammed minicomputer, designed for simulation of general-purpose computer architectures, according to the firm. The unit uses 675-nsec core memory modules for a capacity of 80K words, even though 850-nsec core memory modules are available for systems with a capacity up to 128K words.

Taste of Terminet 30 Available at GE Booth

ANAHEIM, Calif. — General Electric Co. (GE) will show two members of its Terminet printer family — the Terminet 30 and the Terminet 30 — in booth 1467, 1565 and 1567.

While the Terminet 30 is intended for the user who requires a 30 character teleprinter, the 1467 is said to suit those minicomputer users, intelligent terminal users and small-systems users who need a line printer.

Both printers are available for purchase from GE's Data Communication Products Department in Waynesboro, Va. 22980.



Terminet 30

User-Programmable OP-I To Highlight Ontel Exhibit

ANAHEIM, Calif. — Operating out of booths 2744 and 2746, Ontel Corp. will exhibit its Ontel OP-I intelligent terminal system.

User programmable, the intelligent terminal display system is designed primarily for the OEM market and features three microprocessors — a central, a display and an input/output unit.

OP-I can operate in stand-alone or on-line environments, according to the vendor, and programs can be loaded from local storage or a host computer.

The system can be obtained from the firm at 3 Fairchild Court, Plainview, N.Y. 11803.

Ferrite Floppy Head Set

ANAHEIM, Calif. — A ferrite floppy disk head will be featured by Nortronics Co., Inc., in booth 1641.

The unit, H803006, is IBM-compatible and is built in a round holder with the active core area made of dense ferrite and the surrounding area ceramic.

Nortronics is at 8101 Tenth Ave. North, Minneapolis, Minn. 55427.

Terminals:

at

NCC



The Odec contribution to the exhibit will consist of three of the firm's impact printers — the Models 1400, 2400 and 3400 — which range in speed from 125 line/min. to 350 line/min., the firm said. 7725 Washington Ave. South, Edina, Minn. 55435.

Incoterm Software to Perform

ANAHEIM, Calif. — Incoterm Corp. will use booths 1157 and 1159 here to demonstrate its line of intelligent terminals operating under Incoform, a forms-oriented, source-data-entry software package developed for use with the diskette-based SPD 20/20 multi-station intelligent terminal system.

Terminals to be shown include the SPD 20/20 CRT, which includes a terminal processing unit, a 4,096-byte magnetic core memory, a hardware-controlled interrupt structure, an arithmetic logical processor, a refresh module and timing unit, a real-time clock and automatic memory-protect and power-save circuitry.

The SPD 325 video terminal system, a stand-alone remote display system which the company said is compatible with IBM 3270 data communications and power-save circuitry.

protocol, will also be shown. A buffered-printer option allows a remote stand-alone configuration to have a separately addressed and buffered printer.

The SPD 20/20, developed to work in a cluster configuration with multiple display stations controlled by a terminal-processor unit, will also be on hand.

The Incoform system, Incoterm's latest product, provides users with a comprehensive set of applications-oriented, general-purpose software modules for custom-forms design and data-entry control.

The SPD 250 diskette system and the SPD P-100 dot-matrix impact printer may also be seen, the firm said from 6 Stratford Road, Natick, Mass. 01760.

Introducing Sycor's intelli

Store formats and programs locally.

Our new 500,000 character, dual flexible disk option offers Sycor 250 users the best of both worlds: the storage capabilities of a batch terminal with the inquiry/response features of an on-line terminal.

An on-line batch terminal.

Use the Sycor 250 like a batch terminal. Store non-critical data on the diskettes during the day and transmit it to the CPU in batches. Data can be processed at night and sent back, unattended, to the diskette for printing the following morning. And the system lets you continue entering data even during computer or line outages.

For inquiry/response applications, you can store an unlimited number of formats right at the site, instead of being limited to 30 formats at the CPU. So you leave the line free for more critical traffic.

Or you can store your own program locally. Using our Sycor 250's simple, yet sophisticated FIL language, you can cut line time further by catching operator errors on the spot—instead of at the CPU.

All of which means that you end up using that expensive communications network more efficiently. So



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For Remote Communications

Harris Readyng Display of Processors



Harris Corp. Cope 1600

ANAHEIM, Calif. — Harris Corp. will display two of its Cope 1600 remote communications processors in booth 1317.

Also shown will be the company's Cope

technical control system. One 1600 system, with a 600 card/min card reader, two 600 line/min printers, two 3-track magnetic tape units and two synchronous communications interfaces (9,600 bit/sec dedicated and 4,800 bit/sec dial-up) will communicate concurrently with two host processors.

The other Cope 1600, configured with a 1,250 line/min printer, 1,200 card/min card reader and 9-track magnetic tape unit, will be used to host processor at 9,600 and 4,800 bit/sec concurrently. While communicating with dual hosts, both systems will perform concurrent background media-conversion tasks.

The dual 1600 systems will operate through Harris' Cope Technical Control System.

The system displayed will include such

new features as a patch-field panel and multi-drop line controller.

The company's data communications division is at 11262 Indian Trail, P.O. Box 44076, Dallas, Texas.

Motorola Transceiver

Among Array of Units

ANAHEIM, Calif. — The NMOS M6800 microcomputer and various logic devices (ECL), bipolar LSI and linear devices will be shown by Motorola in booth 1462.

A point-of-sale display, utilizing the MC6800 microcomputer, will be operational and the MC6860 modem will be demonstrated in a 300 bit/sec serial data system.

Terminals

at

NCC



Two new devices, the MC10194 dual simultaneous bus transceiver and the MC10183 4-bit by 2-bit multiplier will also be shown. The MC10194 provides two full-duplex, digital data paths; the MC10183 will multiply 2's complement output, without correction, the firm said.

MOS Memories

Memory arrays containing MOS devices such as the MC7001 static 4K RAM and the MC6605 dynamic 4K RAM will also be displayed. Bipolar LSI components for memory systems and serial digital data paths will also be included; these devices are the MC8504/MC8505 refresh logic circuit (for MOS memories) and the MC8504/MC8506 polynomial generators. The MC8504/MC8506 can be used to detect serial data transmission errors, according to the Phoenix-based firm.

D-302 Miniature CRT

To Be Informer Star

ANAHEIM, Calif. — The D-302 miniature CRT terminal will highlight the display in booth 1722 operated by Informer, Inc.

Dual Addressing

The unit has dual-addressing capability as well as polling capability. The monitor displays up to 32 characters each, the firm said, and the unit can operate at a maximum of 9,600 bit/sec.

The device has a dairy-chain capability and is compatible with RS-232 standards, the firm added from 2218 Cotner Ave., Los Angeles, 90064.



Informer D-302

Cal-Tronix Security System Contains 260 Million Codes

ANAHEIM, Calif. — A security system for communications terminals will be displayed in booth 2108 by Cal-Tronix Privacy Systems.

Two Modes

The Model 72 DPD system can be used with high- or low-speed modems in either synchronous or asynchronous modes. The unit contains over 260 million different codes which can be set by thumbwheel switches.

A Model 72A is also available which offers over 67 billion different codes, the firm said from 1102 College Ave., Santa Rosa, Calif. 95404.

Wire-Wrapping Machine Set By Contact Systems

ANAHEIM, Calif. — Contact Systems, Inc. will display a wire-wrapping machine priced at \$8,000 in booth 1125, the firm said from Miry Brook Road, Danbury, Conn. 06810.

gent '3270' BATCH terminal.

you can install more terminals per line, and maybe even install fewer lines.

Remember the intelligence.

Of course, none of this would be possible without the high level of intelligence that we've built into every display. Each display station has its own microprocessor and up to 8K of random access memory for range checking, equal-comparison, arithmetic operations and a variety of other tasks.

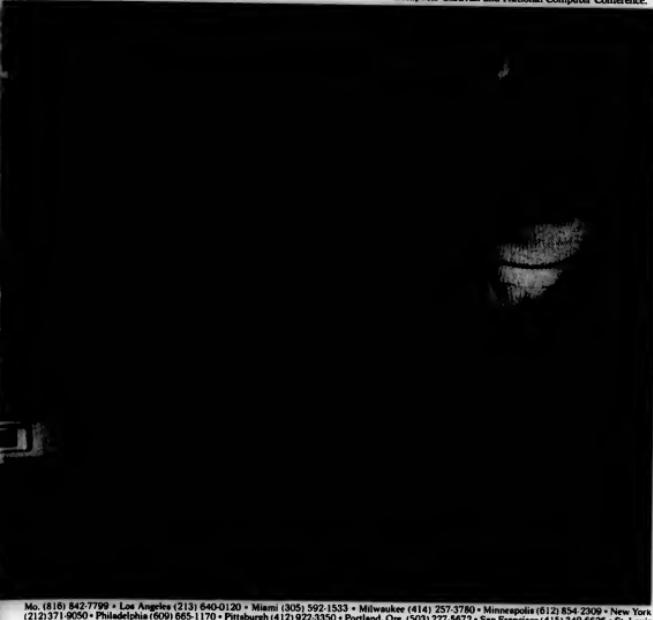
And, when it comes to service, our terminals are backed by a staff of 400 field engineers who serve more

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SYCOR

See Sycor's 250 system with flexible disc at the Computer Caravan and National Computer Conference.



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France's Logabax Importing CRTs For Exhibit by New U.S. Division

ANAHEIM, Calif. — The Logabax terminal from France will be displayed by a new U.S. division of the firm in booth 2659.

The LX 180/57 is transparent on IBM 2740 Model II communications networks, the firm said, provides printing speed of 180 char./sec and prints lines of 220 characters with a 132-character line standard and a 240-character wide.

The unit features 10 preprogrammed message keys, italics and two-color ribbons for a price of \$199/mo on a one-year lease.

The firm will also exhibit the LX 180/KSR which has transmission speeds switch-selectable up to 2,400 bit/sec, full ASCII character set and an optional 10-key pad. It is priced at \$170/mo on a one-year lease.

The U.S. division of the firm is at 10889 Wilshire Blvd., Los Angeles, 90024.



Logabax LX 180/57

First On-Line Showing Of '40+' Display Set

ANAHEIM, Calif. — The first on-line demonstration of International Communications Corp.'s 40+ display is slated for booth 1505 by the firm.

The unit employs a microprocessor and features formatted data entry and editing, forms calculation and a self-diagnostic feature for the base price of \$128/mo or \$1,250 for a one-year lease.

The firm is at 8600 N.W. 41st St., Miami, Fla. 33166.



ICC 40+ Display

Lorain Systems Ready

ANAHEIM, Calif. — Uninterruptible power systems that range in capacities from 500 watts to 2 megawatts will be featured by Lorain Products Corp. in booths 1754 and 1756.

The firm, at 1122 F St., Lorain, Ohio 44052, said a 90 kilowatt system would cost approximately \$68,000.

Voice Synthesizer to Speak At Federal Screw Works

ANAHEIM, Calif. — The Vocal Interface Division of Federal Screw Works will show a voice synthesizer in booth 1557.

The Votrax Model VS-6 electronic voice system provides synthesized speech with an unlimited vocabulary. This small solid-state device accepts standard ASCII characters as commands to produce phonetically programmed human speech.

Continuous Speech

Votrax can produce continuous speech with an input data rate of as low as 150 bit/sec, the firm said.

In addition, the vendor's Vocal Interface Division will be introducing a line of low-cost, limited-vocabulary digitized speech systems, the firm said from 500 Stephenson Highway, Troy, Mich. 48084.



At Bell & Howell

COM Gear to Be Put Through Its Paces

ANAHEIM, Calif. — Booth 2236 will be the scene of a demonstration of computer-output microfilm (COM) equipment offered by the Bell and Howell COM Products Division.

The 3700 Model 3 is a high-speed, multiformat camera with a maximum printing speed of

Monroe to Send

Product Variety

ANAHEIM, Calif. — A range of calculators, scientific microcomputers and a scientific interface will be shown in booths 2718 and 2720 by Monroe.

The Beta 326 microcomputer allows more than 100 programmed operations to be accessed from the keyboard, the firm said.

Communications

The teleprinter interface was designed to allow the firm's programmable calculators to have the capability to communicate to IBM 3270, 3272, 3274 printers, instruments or phone lines through modems or acoustic couplers, the firm said from 550 Central Ave., Orange, N.J. 07051.

ACT Printer Terminal Series Due



Series 900 printer terminal

ANAHEIM, Calif. — The Series 900 interactive dot matrix printer terminal, capable of speeds of 120 char/sec bidirectionally, is coming.

RCA Teletypewriter Coming

ANAHEIM, Calif. — In booth 1703, RCA Service Co. will display its Model 33-ASR friction-feed teletypewriter that is equipped for alternate TWX or Dataphone use.

The Exetel receive-only printer with 8-level ASCII for 10- or 15 char/sec bidirectional printing starting at \$54/mo will also be on display, according to the firm from Camden, N.J. 08101.

26,000 line/min and up to 160 char/line.

Comfito 413

The Comfito 413, available for either black and white microfilm, fiche, exposures, cuts and processes copies automatically, at speeds up to 1,800 fiche/hour (vesicular) or 1,300 fiche/hour (diaz).

The firm will also discuss the capabilities of its Comfito soft-

ware packages, which are available to provide 105mm microfilm and 16mm roll formats. The software is said to allow the user to specify parameters for the desired COM format from either a data file or print image file.

In addition, it is said to allow users with Cobol compilers extensive titling and indexing abilities.

The firm is at 1451 Quail St., Newport Beach, Calif. 92660.

Gould Bringing Printer/Plotters



Gould 5100

ANAHEIM, Calif. — The exhibits of Gould, Inc. in booths 1746, 1748 and 1750 will fea-

ture two of the firm's electronic printer/plotters.

The Gould 5200, designed primarily for engineering and scientific applications, features a resolution of 200 dot/in. vertically and horizontally to increase image clarity. It can produce smooth curves in printing applications, it operates at 650 lines/in. while generating 132 char./line on 11-in.-wide paper.

Two Fonts

It has an eight-bit data path for input and output and a 96-character ASCII set with both Helvetica, Medium and Times Roman fonts available as standards.

The Gould 5100 plots graphic material, such as A to D size engineering drawings on 22-in.-wide paper up to three in./sec with a resolution of 100 dot/in. vertically and horizontally.

Interfaces are available to connect both units with most mini-computers, the company said from 20 Osipov Rd., Newton, Mass. 02164.

Computer Link Focus

On Forms Processing

ANAHEIM, Calif. — Forms processing will highlight Computer-Link Corp.'s display in booths 2619 and 2621.

The Boebe 182 system handles forms from the computer printer and prepares them for the post office by decollating, bursting, slitting, bypassing, folding, adding inserts, enveloping and metering postage.

In addition, the firm will display the Series 400 reinking machine, which is capable of handling OCR as well as regular ribbons, according to the firm at 14 Cambridge St., Burlington, Mass. 01803.



Anaheim

Van San Exhibit Stars Quietizer

ANAHEIM, Calif. — Van San Corp. will display its Quietizer unit, a lightweight cabinet designed to control noise produced by the Centronics printer in booth 1254.

For use with the printer on a stand, desk or table, the unit can be installed without fasteners, tools or machine modifications, the company said.

Pixelglass Shield

A pixelglass shield allows inspection during machine operation and may be raised for loading and adjusting paper and for access to all controls.

Van San is at 1180 Centre Drive, City of Industry, Calif. 91748.

Plotters to Bow At Glaser Booth

ANAHEIM, Calif. — A line of computer graphic output plotters will be displayed for the first time in booth 1258 by Glaser Data Co.

The DP-1500 can be used with minicomputers or larger systems and produces graphics on a 17-1/2-in. by 22-1/2-in. flat bed. It contains a built-in microprocessor which is said to simplify the software needed to operate the system, as well as generating up to 55 standard alphanumeric types.

The DP-1600 is for larger drawings with a 22-in. by 34-in. bed. The plotting speed of this unit is 800 increment/sec or 3 in./sec in X-Y axis or 4.5 in./sec in diagonal axis, the Swiss firm said from its U.S. office at 225 Forest Ave., Palo Alto, Calif. 94301.



Glaser DP-1600 Plotter

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Versatec Plotters Coming



Versatec printer/plotter

ANAHEIM, Calif. — Three electrostatic printer/plotters will highlight the display of Versatec, Inc., in booths 2558 and 2560.

The D2030A prints at a speed of 1,200 line/min or 3 in/sec on 20-in-wide paper. The unit, using a dual array writing head, is priced at \$14,900.

Universal Data Line

Of Modems Expected

ANAHEIM, Calif. — Universal Data Systems plans to introduce the UDS-201A, the UDS-201B



Universal Data Modem

and the UDS-201C CMOS stand-alone modems in booth 2267, the company said from 2611 Leeman Ferry Road, Huntsville, Ala. 35805.

Mitsui Printer Show

ANAHEIM, Calif. — Mitsui & Co. will invade booths 2646 and 2648 with the Shinko M-60 60 char/sec impact printer.

The unit, with a 128-character set, features two-color ribbon, pica or elite printing, the firm said from 172 Newton Road, Woodbridge, Conn. 06525.

A C-Tek controller and 1100A printer/plotter for reproducing images from a Tektronix display will also be exhibited. The unit costs \$595 for the controller and \$6,900 for the printer/plotter. The third item on display will be the Quick-Writer, which was designed for word-processing applications. Operating at 500 char/sec, it is said to be 30 times faster than an editing type-writer in the power mode.

COMPUTERWORLD

And On...



The unit costs \$9,700, according to the firm at 10100 Bubb Road, Cupertino, Calif. 95014.

Special Events Agenda

ANAHEIM, Calif. — In addition to sessions focusing on the 18 program areas at the 1975 NCC will offer a wide range of events for attendees under the headings of "Supplements" and "Special Events."

Jay W. Forrester of MIT, who will deliver the key speech of the day Monday morning, will discuss computer modeling of social systems with reference to the economic forces underlying current inflationary trends.

On following days there will be either a special address, as on Wednesday with Jimmy Carter, former governor of Georgia, or luncheon speakers.

Tuesday will feature the conference luncheon with Neil Gorchow, vice-president of product strategy and requirements at Univac. John E. Sheehan of the Federal Reserve System will address the luncheon on Thursday.

Monday evening there will be a conference and international reception.

Attendees at both evening sessions can select from two on Tuesday. One will feature trade press editors and the other will look at demands on DIP industry in 1980-1985 as seen through a Share, Inc. report.

Attendees who want to caress through Disneyland will enjoy Disneyday on Wednesday, when the park will be open to attendees from 10 a.m. to 10 p.m. for \$4.75 per person. Disneyland normally closes at 6 p.m.

Also, on Wednesday afternoon, there will be a Pioneer Day program with a team associated with Dr. John von Neumann at the Institute for Advanced Study at Princeton. Speakers will include Dr. Willis Ware of Rand Corporation, Herman Goldstine and James H. Pomerene of IBM and Jules G. Charney of MIT.

Special activities chairman Ross Penne is a high school computer science faculty member of film director and a special effects expert "The Silicon Age."

Supplemental schedules will offer a look at program funding, computing as applied to societal problems and the impact of DIP on society through library systems.

Other sessions will include technological advances through aerospace requirements, analysis of design measures and applications in areas such as manufacturing, publishing and simulation as well as a look at data base management in the humanities.

DMI Ready to Introduce Cartridge Inspector Unit

ANAHEIM, Calif. — Data Maintenance, Inc. will introduce the DMI 500 cartridge inspector in booth 1453, along with major plans to expand its turnkey disk cleaning and inspection service.

The unit will have 50 calls for establishing 50 service centers equipped to inspect and clean both disk packs and disk car-

tridges in major marketing areas around the country.

The Model 500 inspector enables the operator to scan both disk surfaces with a magnified optical system that also illuminates the data on the disk. The unit is priced under \$1,000 in small quantities, according to the firm at P.O. Box 2727, Rolling Hills Estates, Calif. 90274.

Tektronix Sets Three Announcements

ANAHEIM, Calif. — Tektronix, Inc. will introduce three products — ranging from a digital tape cartridge memory to a graphics terminal — in booth 1417, along with an exhibit of some of its older display terminals.

The 4923 cartridge unit is an off-line device that uses the Cm. DC2030A cartridge and interface with the 4010 family of terminals or to an RS-232C interface. It will operate at data rates up to 9,600 bit/sec with a formatted byte width of 2000 bytes.

The 4631 hard-copy unit is capable of copying the entire 4010 series of terminals on a plug-compatible basis. Priced at \$400 to \$900 less than previous hard-copy units from the firm, the unit can also copy the 613 storage display.

Harris to Headline Its Test Equipment

ANAHEIM, Calif. — Test equipment and the introduction of a new service bureau will highlight the exhibit in booth 1317 put on by Harris Corp.'s PRD Electronics Division.

An automatic system to test circuitry assemblies and verify circuit design will be on display along with a mid-size 11A digital/analog tester, which is computer-controlled to provide automatic fault isolation. It has an on-line compiler and editor to facilitate the generation of test program sets, the firm said.

The new service bureau was designed primarily for the mortgage banking industry, the firm said from 6801 Jericho Turnpike, Syosset, N.Y. 11791.

Jacquard Highlighting Card Embosser Model

ANAHEIM, Calif. — The Jacquard Model E 100 desktop card embosser — which will be shown in booths 2352 and 2355 — is capable of processing at rates of 1200 to 2400 char/min or from 2 to 4 standard credit cards per minute with full 72 characters to American Banking Association standards.

When used as a self-contained unit, the Jacquard needs to be hand-fed to the unit and the date entered by keyboard.

The unit, which costs \$5,000, can be interfaced with the Jacquard J 100 Videocomputer and peripherals, however, to give a complete computer-controlled embossing system with automatic feeding and stacking, according to Jacquard Systems at 1505 Eleventh St., Santa Monica, Calif. 90404.

The third product will be the RE4012 terminal, built to withstand extremes in temperature, humidity, vibration and shock. It will be interfaced with the 4921 floppy disk memory, the 4933 graphics tablet and the 4631 hard-copy unit.

Among the firm's standard line of equipment, there will be the 4014 graphics terminal, the E4010-I graphics terminal (an economy version of the 4010 priced as low as \$3,795) and the 4023 alphanumeric refreshed terminal.

Encoder Series

Mag-Tek Focus

ANAHEIM, Calif. — The line of magnetic strip encoder/verifiers of Mag-Tek, Inc. will be on display in booth 1220.

Designed for banks, savings and loans institutions, airlines or other credit/identification issues, the units can be operated manually or as part of an automated system. Here they can encode as many as 500 card/hour, the firm said.

The units utilize individual read and write heads, the firm said. There are four models: I with ABA numerical-only code; II with ABA, IATA and Mints codes; III with ABA, IATA and Mints, and Mints, numerics only. The firm is at 1513 E. Del Amo Blvd., Carson, Calif. 90746.

Motorola Spots MPA-1

ANAHEIM, Calif. — Motorola Display Products plans to show the MPA-1 logic analyzer in booth 1347.

The unit, designed to analyze both hardware and software operation of microprocessors, displays 22 bits of 24 bits each in hexadecimal characters on a 9-in. CRT screen.

In addition, the firm said it plans to announce a line of CRT displays in 5-in., 9-in., 12-in. and 14-in. sizes that incorporate interchangeable components and plug-options.

Motorola is located at 455 East North Ave., Carol Stream, Ill. 60187.

Magnasonic Heads Due

ANAHEIM, Calif. — Magnetic heads ranging from those compatible with IBM 7- and 9-track tape drives to those for floppy disk and cartridge tape systems will be displayed by Magnasonic Devices, Inc. in booth 2601, the firm said from 290 Duffy Ave., Hicksville, N.Y. 11801.

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Model 562
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NCC — Booths 1201 — 1203

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COMPUTER INDUSTRY

Two Surveys Present Varied Views of User Spending

Growth to Slow To 8% in 1975

By a CW Staff Writer

PALO ALTO, Calif. — Average DP spending growth will drop to 8% this year as a result of budget changes made in the early weeks of 1975, according to a study released recently here.

Although 85% of the survey's respondents are looking for a business upturn in the second or third quarter of 1975, more than a third expect to reduce their DP expenditures, keeping growth below 4%, the report said.

Another 30% expect growth between 5% and 9%, including allowance for inflation.

The study estimated equipment expenditures will increase by 6.9% in 1975, with growth the fastest in communications-related equipment, particularly terminals.

Input said its findings were based on a telephone survey of 110 corporate, financial and DP managers of 119 Fortune 500 companies as well as major government agencies, which together spent \$15.6 billion, or 60% of the DP industry's total revenues in 1974.

No medium- or small-scale installations

Spangle Confirms Talks On Honeywell Bull Merger

MINNEAPOLIS — Negotiations regarding the merger of Honeywell Bull with Compagnie Internationale Pour l'Informatique (CII) are in progress, Honeywell Information Systems President Clarence W. Spangle told stockholders here last week.

Talk of such a merger has been circulating for over a month (CW, April 21).

Meanwhile, sources reported the French government is willing to allow the merger, but is withholding judgment pending polling of CII's Unidat partners, N.V. Philips and Siemens A.G.

Reduce Holdings

Spangle cautioned negotiations could break off without agreement. Terms being discussed would reduce Honeywell's holdings in Honeywell Bull to less than a majority, for which it would receive cash in return.

Compagnie des Machines Bull, which owns 34% of Honeywell Bull, would hold the majority interest in the new firm, which would be called Compagnie Internationale Pour l'Informatique-Honeywell Bull.

were surveyed.

Three areas — insurance, banking and the federal government — share the top rank for growth in DP expenditures in 1975 which is expected to hit 11%.

Next is process manufacturing with a 9% anticipated growth rate.

The sectors experienced less pressure from the recession, which allowed them to stay closer to past DP expenditure growth rates of 15% to 16% annually, the report said.

Transportation and utilities, among the hardest hit by the recent recession, rank lowest in terms of growth rates with the retail industry just slightly ahead.

Transportation and utilities are expected to spend only 4% more on DP in 1975 than 1974, and the retail industry, despite wide-range spending on new point-of-sale equipment, is expected to spend only a 5% increase in DP spending.

These two sectors are expected to bounce back in 1976 with an estimated 14% and 9% growth rate, respectively.

Users surveyed will spend \$6.7 billion, or about 39% of their DP budgets, on equipment this year, for an increase of only 6.9% over last year's equipment purchases.

This represents less than half the 15% increase as the typical year-to-year industry-wide increase.

Input attributed the drop to the "stretch-out" of large development projects, which require considerable computer time for production processing and the need for new CPUs.

General cutbacks and delays in most equipment subcategories are responsible for this reduction. Only terminals and data communications equipment expenditures will continue at a high rate, the report said.

Computer services are expected to produce about \$1.9 billion in revenues for an overall growth rate of 10.1%. Growth rate in services has been nearly double this figure during the past 10 years.

The drop was attributed to a general shift from large, user-interactive timesharing services to in-house or remote batch processing.

Personnel expenditures will be the hardest hit, with the slice of the budget pre-allocated to personnel actually shrinking from 39.3% in 1974 to 38.4% in 1975, input said.

The overall growth rate — only 5.9% — translates into \$6.5 billion in spending.

Input projected an actual decrease in the number of DP users in transportation and retail sectors.

Input's projections were severe in several companies surveyed, according to the report, with some indicating that the previous three or four years of prosperity had added considerable fat to development and systems staffs.

Budgets to Rise 14% During Year

By Nancy French
CW Staff Writer

WALTHAM, Mass. — The recession that upended growth rates in almost every other industry will scarcely dent computer suppliers' profits this year, judging by a survey of 1,000 companies conducted by International Data Corp. (IDC).

Describing spending as "bright for all of 1975," the IDC report estimated DP spending will reach \$25.3 billion this year, with suppliers feeling only "minimum" recessionary impact.

As a result, year-to-year budgets for equipment, supplies and services still were up 14% over those reported in 1974, the report said, with communications gear expected to be the single largest area of product growth.

Excluding terminals and auto transaction equipment, the report estimated users would spend about \$1 billion for communications gear in 1975.

A smaller percentage of total expenditures will be spent on CPUs in the near future, IDC said. As the IBM System 370 life cycle winds down, equipment spending will "drift out" from the CPU.

Disk drives, terminals and communications controllers, which alone will account for 33% of the equipment shipped to IBM users this year, will account for most than 40% by 1976.

Upgrading Downgraded

Real dollar growth in user purchases is projected to decline in anticipation of the next generation of equipment, the report noted, with fewer than 15% of users surveyed planning to upgrade in 1975.

Independent peripheral manufacturers — especially those offering disk drives, terminals — should reap the back-hand rewards of recession, according to the report.

Plug-compatible equipment is being used at 65% of large-scale IBM sites and at 33% of medium-scale (single CPU) sites.

The report was based on a survey of 63 Fortune 500 users and 65 medium-scale users. The Fortune 500 users, which included CII, IDC called "leading-edge data processors," represent 35% of the installed base.

The others, referred to as "breadbasket" companies, represent 55% of the installed base.

The \$25.3 billion spending predicted by IDC — nearly double that spent just five

years ago — excluded first-time installations, the report pointed out.

Inflation accounted for only one-fifth of the increase in hardware spending reported, IDC said.

Demand Props

The report indicated several important factors were fueling up user demand. • Demand for DBM/TP was considered to be essential for a modern company's survival, spring from long-term commitments not easily broken.

• Migration to data base management (DBM) and teleprocessing (TP) has spurred applications development, and users are continuing to increase their computer investments. Virtually all large-scale users and 44% of the medium-scale users will be into DBM/TP by the end of this year.

• Computer operations are developing into on-line company-wide systems. Thus integrated into the functional structure of a company, DBM/TP can winnowed from necessary expenditures.

• Machines at medium-scale sites work an average of two shifts a day, and at large-scale sites, around the clock, with little capacity left to handle increased workloads.

When users' 1975 budget pie is sliced, salaries will eat up the lion's share, with 36% allocated for systems and 35% going for salaries.

The slice for services is the third largest, with 12% of DP budgets going for services of all types.

Supplies, communications line costs and support software each will get an equal 5% slice and, finally, software, with the smallest piece, has been allotted 2% of total DP budgets.

Rather than cutting hardware spending, users will choose to "put the lid on personnel spending," the report noted.

IDC found no significant shift from the other traditional method of beating DP costs — namely, postponing equipment acquisitions and delaying new applications," the report said.

"Only 5% of the large-scale sites had to renew on a mainframe commitment," IDC said.

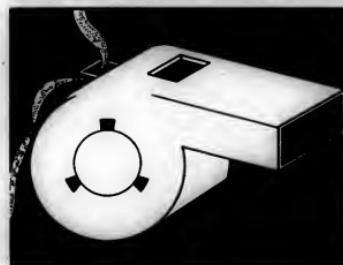
In the hardware category, inflation had little effect, the report said, thanks to fixed contract prices, long-term leases and third-party deals. Large-scale sites, for example, will feel a net price increase of only 2.1%.

Medium-scale sites — where upward mobility dictates more rental and less purchase — will have a 3.3% rise.

BASF Delivers Winchester Modules

BEDFORD, Mass. — BASF Systems has made what it claims are the first diskless modules of independent Winchester-type modules for use on IBM 3340 drives.

Deliveries have been made of the 35M- and 70M-byte modules. The 75M-byte unit is scheduled for shipment later this year.



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Vocational Specialization Working at NCR

DAYTON, Ohio — NCR Corp.'s strategy of vocational specialization is working, Chairman William S. Anderson told stockholders in the firm's annual report.

Semiconductor Market Projections Lowered by Wema Survey Results

PALO ALTO, Calif. — A survey released by the Western Electronic Manufacturers Association (Wema) revised downward the group's projections about the semiconductor market for 1975.

Although the report expressed a belief that the decline in semiconductor sales has "bottomed out," it predicts the 1975 worldwide market, excluding eastern block nations, will show a 17% decline over 1974.

This decline will be group's October forecast, which called for a flattening of usage.

The report sees total worldwide semiconductor consumption of \$3.87 billion for 1975, compared with \$4.67 billion for 1974. The results of the October outlook were changed to reflect "the grim reality of the fourth quarter of 1974 and the first

"We are focusing our assets and efforts on those markets where we can do a better job than any of our competitors, large or small, new or old," he said.

As an indication of the plan's

quarter of this year," said Marvin S. Cox, president of Internal, Inc.

Broken down by product types, the new estimate includes a \$2.09 billion in discrete devices, a 17% drop from the estimated \$2.52 billion in 1974 and \$1.77 billion in integrated circuits, down 18% from the \$2.15 billion estimated for 1974.

Cox noted that the recovery already has started in the overseas markets. Because of this and encouraging signs that orders are beginning to increase again domestically, expectations are the recovery will reach full swing by the fourth quarter and normal growth rates will return by 1976.

The Wema forecasts 1976 worldwide semiconductor consumption of \$4.84 billion, a 25% increase over 1975.

success, NCR has been able to improve its position in the industry last year, "despite a very aggressive effort on the part of several newcomers to that industry," he noted.

The markets targeted by NCR are retailing, banking, certain segments of the industrial and commercial markets, hospitals, schools and government.

NCR should attain further growth in revenues and earnings in 1975, he said, pointing out several stabilizing factors in the firm's mix of business.

For instance, about 22% of revenues come from equipment rentals and another 41% of total revenues is contributed by ongoing services, supplies and paper business, "and this also tends to compensate for sharp swings in the market," he said.

But while not being all things to all people, NCR is planning to move into the larger systems field, recognizing the trend toward on-line systems in some of its key markets.

It has established a Communications Systems Division to consolidate its telecommunications hardware and software development and manufacturing.

The Special Systems Division is in charge of overall design of large communications networks.

NCR's development program in mainframes is compatible with future Control Data Corp. computers "is well under way" and the program for an integrated product line of mainframes, based on the guidelines established by the two companies' Advanced Computer Laboratory, is on schedule, Anderson said.

"The program will provide us with very powerful central processors capable of serving large DP networks. It will also enable us to upgrade our larger customers to on-line systems."

The joint company, Computer Peripherals, Inc., is "now producing peripherals designed from the start as common products, rather than modifying products from the two companies' separate product lines as it did originally," Anderson said.

Anderson foresees NCR increasing its share of the computer market and cited the demand for firms to provide complete systems, which involve a variety of data terminals located where data originates.

Elgar also forecasts for almost one-third of revenues of the computer industry to be derived from various types of data terminals by 1980, Anderson observed.

Although the firm is carefully watching capital expenditures, during 1975, investment in property, plants and equipment will rise somewhat, he said.

R&D expenditures will also rise to \$90 million from \$74 million in 1974. In 1975, Elgar expects to generate 3.7% of revenues. The firm hopes to go to a 5% level as profitability continues to improve, he said.

"Not only are we spending more R&D dollars, we are getting more out of those dollars through a better organized effort."

International Operations

NCR has revamped its international operations into four major

trading areas to maximize revenues from these operations. Last year, foreign operations contributed over half of the firm's \$1.98 billion in revenues.

The firm expects international business to continue to grow, although problems that complicated overseas operations in 1974 are likely to continue.

The international division's orders in 1974, up 9% over 1973, have created a sizable backlog, the annual report stated.

Instances of NCR's ability to use R&D capability in overseas areas include the 29% a product of NCR Germany; the 775 electronic proof system, designed and made in Canada; and the firm's first electronic cash register, contributed by Japan.

As an extension of the vocational approach, NCR intends to expand its packaged computer systems developed for special applications,

Revenues for 1974

Revenues for 1974 are broken down somewhat, revealing that the firm's engineering operation produced \$382 million in 1974 and DP centers \$58 million, an 11% increase over 1973 figures.

One of the fastest growing parts of the data center business is its computer output microfilm (COM) service, the report said.

Business forms and supplies contributed \$191 million to revenues, up 13% from 1973. Heat-sensitive paper used in thermal printers is another of the fastest growing areas.

Equipment sales, weighed in at \$377.4 million, up 8.1% increase over the 1973 figure, while equipment rentals advanced the least, 0.6% to \$246.5 million.

Paper production showed an 8% increase to \$188.5 million.

NCR's current product groupings are computer systems, terminals and data communications and free-standing business equipment. All but the latter showed substantial gains in revenue during 1974 compared with 1973.

Computer systems' revenues grew to \$385.7 million from \$363.8 million in 1973, while terminal and data systems' revenues jumped to \$295.8 million from \$152.6 million in 1973.

But, looking at the former product groupings, the gains are not as clear-cut. Revenues from data terminals increased 1974 to \$350.7 million from \$363.8 million; those from DP equipment showed a slight rise to \$312.8 million from \$295.3 million; accounting machines rose to \$377.1 million compared with \$326.9 million in 1973. "Other products" also grew slightly.

A glance at the changes in consolidated financial position shows NCR's cash and short-term investments diminished to \$56.3 million in 1974, down \$64.4 million from the 1974 figure of \$120.9 million.

However, inventories soared, growing by \$220.6 million to \$739.4 million compared with \$518.8 million in 1973.

During 1974, NCR adopted the "last in, first out" (LIFO) method of accounting for its paper, business forms and supply inventories, which reduced earnings for the year by about \$4 million.

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Despite Rock-Bottom Bidding

Disk Cartridge Prices at Plateau: Gabai

By Molly Upton
Of the CW staff

CHATSWORTH, Calif. — Although some cartridge disk makers are bidding on contracts at rock-bottom prices — in efforts to build up their production volume — the general price was going on in this area, according to Ralph Gabai, vice-president of marketing for Perfec Corp.'s Peripheral Equipment Division.

Generally speaking, cartridge disk prices have come down and are pretty reasonable, he said.

But in certain instances where vendors are seeking contracts from credit-worthy firms, "pricing has gotten pretty aggressive," he said.

In some instances, he explained, prices have come down because it has established its base and knows what its production costs are. "It's a business decision," he explained.

Gabai explained that "no one really competes with the Diablo 31, a 2.5 MB byte drive. It's a very specific device, it's been around for four or five years and it's got

a huge production volume," he explained.

"Our product line, while it has a version in that capacity, has really succeeded as the mini and systems house users have strived to go to larger capacities."

Perfec's cartridge disk cartridge disk is designed to provide upward compatibility to the larger sizes such as 6 MB bytes and 12 MB bytes, he said. "So that's a different class of product, as they cost more, although the cost per bit is lower," he said.

Gabai noted that the "fine art of 'specmanship'" enters into

the disk marketing picture when one talks about the size of disks.

"It's a little bit of a farce if it could be anywhere from eight to 10 bits, depending on how you want to play the game."

Perfec currently offers two versions of cartridge drives, one model with a single removable cartridge and one model with one fixed platter and one removable. It also makes floppy disk drives.

"There are some things in the wind," he said, probably in the fixed-disk area.

Peripherals, Dedicated Processors

Soon as Major Micro Applications

LOS ANGELES — The major applications area for microprocessors over the next several years will be intelligent peripherals and dedicated processors, according to Dr. John Salzer, vice-president of Darling & Associates, a management consulting firm here.

"Point-of-sale units, CRT terminals, printers, data entry devices and a variety of other I/O units will have a broad range of new capabilities added as a result of the microprocessor technology," he predicted.

Use of microprocessors in control devices will also be important, "but the DP peripheral market could easily be many times as large as a user of microprocessor technology within the next two years or so," he said.

The higher-speed bipolar microprocessors now being introduced will achieve significant market penetration in 1977, according to Salzer's analysis of the technology.

"But there will be a substantial price premium exacted for the hardware," he said.

As a result, in 1977 the majority of microprocessors in use are likely to be versions with speeds not much greater than those in use today due to the cost/speed constraint.

"Toward the end of the 1970s, though, the price differential between high-speed and low-speed microprocessors will have narrowed, thus opening up a wide range of new high-speed uses for the devices," he concluded.

CIT Financial Signs On to Become

Eastern Airlines' Biggest DP Client

NEW YORK — CIT Financial Corp. has signed a multimillion dollar, multiyear contract with Eastern Airlines that will put CIT Financial Services' 800 offices on a computer network operating from Eastern's Doral Computer Center in Miami.

Terms of the deal, "one of the most complex commercial computer systems ever developed," the data processing and business communications network, to be known as Citation, is driven by two IBM 370/195 computers.

It uses Honeywell 716 systems in 13 regional concentration centers and GTE 5540 Model 2

terminals.

The signing of CIT Financial

Corp. brings to about 20 the number of DP customers Eastern serves. CIT is expected to utilize about 16% of the center's processing power, making it Eastern's largest client.

The Citation system is the result of a long development effort dating back to 1971. Because Eastern incorporated fare calculation capability in its computer system as well as the basic flight reservation system used to handle reservations, its system is "particularly well suited to serve CIT's consumer financial operations," a CIT spokesman said.

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Hitachi Mini Has 'Plus'

TOKYO — Hitachi Ltd. has unveiled its Hitac 20 mini-computer that incorporates a PL/I-like language called Programming Language for User's System (Plus).

The unit, basically an improved version of the Hitac 10 and Hitac 10II, features microprogramming control and extensive use of LSI, the company said.

Modular in design, the system allows the floating-point arithmetic adapter, hardware debut adapter and I/O control adapter to be assembled in various combinations, Hitachi said.

Communications capabilities have been improved, including a range of terminals "in-house," and the Hitac 20 can communicate with other

members of the Hitac family, the firm said.

Among the features of the in-house transmission system, which has a transmission speed of 50 kbit/sec, is a group polling method, said to reduce response overhead despite an increase in the number of terminals.

Cycle time is 650 nsec, and both medium- and high-speed floating-point arithmetic are available.

First deliveries are scheduled for this October. The price of a minimum configuration nondisk system, which includes 8K words of memory and typewriter, is \$14,850.

For a minimum disk configuration costs about \$33,000 with 8K words, 2.5M word disk and typewriter.

Survey in Germany Finds

Potential Mini Users Unaware of Makers

By Vic Farmer
Of the CW Staff

HANOVER, W. Germany — If Data Corp., Deutschland is any guide, minicomputer manufacturers may have a difficult time trying to break into the rapidly growing small business computer market here.

Robert A. Lachnit, editor of *EDP Deutschland Report* (EDP) magazine, studied over 400 German companies, each with fewer than 500 employees, to determine just how aware small company management is of the major minicomputer manufacturers. The first few all come from IBM, with an IBM System/3 type of system, magnetic card business machine or a minicomputer adapted for commercial work.

Lachnit analyzed the present small computer market as a

three-pronged confrontation.

The large mainframes, such as IBM, are offering smaller systems to the market. The mid-size small systems business of such companies as Nixdorf. But now, into the small business computer market fray, the minicomputer companies have launched a full attack.

The problem, Lachnit sees it, is that the minicomputer firms such as Digital Equipment Corp. are just not known in the small end-user business market. These minicomputer companies have established themselves in the major scientific and process control areas, but exposure in those markets doesn't help the minicomputer manufacturer at all in the small business market, he said.

This means the minicomputer makers are faced with a long, hard battle to break into the small business market. In Germany, for example, DEC is number one in number of installations of minicomputers, followed by Dietz (the German minicomputer maker), General Automation, Data General, Krauss-Maffei, Tele-Information, Uni-com and Interdata.

This ranking does not include the number of installed process control computers.

But in the EDP/DR awareness study, Lachnit conducted, potential buyers of minicomputers thought the leaders in minicomputer systems were IBM first, followed by Siemens, Nixdorf, DEC, Hewlett-Packard, Honeywell-Bull and Univac.

The study further showed that 58% of the firms' managers have never used a minicomputer. 15% admitted of not even being able to recognize Dietz; 73% could not recognize Data General and 93% had never heard of General Automation.

Lachnit also said the survey demonstrated smaller and less sophisticated users were more

sensitive to a computer supplier's image and, conversely, more sophisticated users were generally less sensitive to a firm's image.

The survey group could not

International News

readily distinguish the differences between minicomputers, magnetic ledger card systems and small business systems, the study concluded.

This, Lachnit explained, is why IBM and Nixdorf were listed as minicomputer makers by the respondents, although they do not offer minicomputers in the classic sense.

Lachnit advised that minicomputer firms contemplating the small business computer market to consider heavily the cost of developing this new market, since the smaller prospective users are likely to have no awareness of a minicomputer as a possible answer to their DP needs.

Aussex Bid Requests Come Without Details

SYDNEY, Australia — Although Aussex, the Australian bid requests, the Australian Post Office (APO) said its actual requirements for new data entry systems are not now known.

The APO is looking for bids on equipment to replace existing paper tape systems, although the new units should prepare data in the format most commonly used, according to a report in *Pacific Computer Weekly*.

Although output will generally be on tape, the APO is investigating interfacing some of the systems directly with its Honeywell mainframes.

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OEM Peripherals Group at Microdata Projects '75 Revenues at \$5 Million

ready has a couple of substantial contracts as a start.

Microdata considers the products very reliable, he said, noting it gets instant feedback from its Reality customers, whereas peripherals makers have to depend on word of filter through their OEM customers.

Although the firm does not plan to embark into other peripheral product areas, it does intend to extend the line of tape

and disk drives. It is starting production of a 10M-byte cartridge disk drive, and 10 units will be placed in the field in March for evaluation.

Another possibility is supplying interfaces for specific equipment such as Data Equipment Corp. products. Currently, Microdata provides the units on an OEM basis without interface.

Thought is also being given to designing a "universal" interface

Dave Carlson assembles tape drives.

IRVINE, Calif. — Microdata Corp.'s OEM Peripherals Group expects revenues of \$5 million in calendar '75, said Larry Ferguson, project engineer to the group.

The group was formed last fall to promote Microdata's 10-1/2-in. tape drive and 5M-byte disk drive. The reasoning was that larger volume, obtainable from OEM sales, would enable the firm to make the products at less cost, he explained.

Microdata has been making tape and disk drives in-house last summer and the tapes about a year and a half ago, he said.

Initially, the marketing strategy is to be price competitive, he said.

The peripherals market seems to have firmed up somewhat in pricing, Ferguson said, with more firms adhering to published prices.

"We can afford to be here long enough to prove we're here," he said, noting that the group al-



Microdata Disk Drives

using the Micro One, he said.

Microdata is also developing its own CRT, but this will be used

solely with the Reality system and will not be marketed by the group, Ferguson said.

Contracts

General Electric Data Communications Product Department has been awarded a contract by Datapoint Corp. for delivery of its Terminal 120 line/min printers which will be incorporated into Datapoint's existing product line.

Applied Digital Data Systems has been awarded a \$600,000 contract by Computer Management, Inc. to supply 500 Consul 580 CRT terminals within the next 18 months for inclusion in its Megabit and Capable system.

Unitec has been awarded a contract for software support services and data base management by the Environmental Protection Agency. The contract covers the Community Health Environmental Surveillance System which analyzes effects of airborne pollutants on human health.

Zeta Research has received a contract to totaling more than \$300,000 to the Florida Dept. for Model 150 plotters to be used in Florida's data systems which analyze organic compounds.

The Management Group, Inc. has been awarded a contract from the state of Maine for extended development of an online welfare eligibility/grant computation system for the Aid for Dependent Children (ADC) Welfare Program.

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Announces May's Resignation

Potter Seeks Court Protection

PLAINVIEW, N.Y. — Potter Instrument Co. has filed a complaint to invalidate the security agreements of its bank loans, noting it is a "debtor in possession."

Potter "is a debtor in possession under Chapter 11 . . . and intends to continue its operations and fulfill its commitment to its customers," John T. Potter, executive vice-president, Robert J. Brown and Samuel Alexander, newly elected vice-president.

Alexander is president of Potomac Federal Consultants Inc., a firm that was unsuccessful in its attempt to put together a recapitalization plan for Potter.

unsecured creditors. The latest move would protect it from claims of its secured creditors, led by the Marine Midland Bank.

In addition, Potter announced the resignation of George W. May, president, and duties will be assumed by an executive committee comprised of Potter, executive vice-president, Robert J. Brown and Samuel Alexander, newly elected vice-president.

Alexander is president of Potomac Federal Consultants Inc., a firm that was unsuccessful in its attempt to put together a recapitalization plan for Potter.

David L. Porter, also of Potomac, was elected a vice-president.

Potter intends to resume domestic manufacturing operations, which it suspended "temporarily" prior to filing Chapter 11 [CW, April 16].

Negotiating With Raytheon

The firm is negotiating to have Raytheon Service Co. take over maintenance of its installed base. Such an agreement would need approval by both the court and the U.S. Securities and Exchange Commission.

Potter's Chapter 11 petition showed current liabilities of \$25.6 million, including the \$18.1 million current portion of long-term debt, and current assets of \$11 million. John T. Potter also has filed personal bankruptcy.

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Belief in Memorex '75 Profitability Bolstered by First-Quarter Results

SANTA CLARA, Calif. — The president of Memorex Corp., Robert C. Wilson, has reaffirmed his belief Memorex will be profitable in 1975, noting the turnaround scored in the first quarter.

Wilson "is beginning to toward a level of profitability of which the firm can be proud."

During the first quarter ended March 31, the firm earned \$1.6 million or 36 cents a share, including a \$575,000 tax credit, compared with a loss of \$1.6 million or 37 cents a share in the year-ago quarter.

The loss from foreign exchange adjustment totaled \$1.3 million in the 1975 period and \$1.7 million in the 1974 quarter. Results for 1974 have been restated to reflect a change in accounting for foreign translation adjustments.

Revenues rose more than 25% to \$61.6 million compared with \$48.8 million a year ago.

Cash and short-term investment balances increased by \$1.5 million during the quarter to \$15.9 million while the firm repaid \$10.3 million of senior notes.

As factors contributing to the turnaround, Wilson cited the restructuring of loan agreements

and increased sales of equipment as well as actions taken by employees throughout 1974 and the first quarter to conserve cash, increase revenue, reduce costs and improve margins.

Wilson said unless the forces of recession, inflation and devaluation become greater than currently anticipated, Memorex will be profitable for the total year 1975. In 1974 the firm lost \$9 million.

Memorex's objectives for 1975 include profitability, establishing the base on which long-term, profitable growth can be built and improving its reputation for excellence in all areas, he said.

The firm plans to make a formal announcement in the second quarter concerning the \$10 million principal amount of its convertible debentures, at \$350 net for each \$1,000 of principal amount plus accrued interest.

Tab Products Doubles Nine-Month Earnings

PALO ALTO, Calif. — Tab Products, Inc. more than doubled its nine-month earnings in the period ended Feb. 28, with record third-quarter results.

For the nine-month earnings at the maker of computer accessories, office filing systems and data entry products reached \$1.2 million or \$1.42 a share compared with \$560,000 or 67 cents a share in the year-ago period.

Revenues rose 43% to \$27.2 million compared with nearly \$19 million in the same period last year.

Earnings Rise 39%

In the third quarter, Tab's earnings reached \$320,000 or 39 cents a share, a 39% rise over the \$220,000 or 27 cents a share in the year-ago quarter.

Revenues rose 36% to \$9.2 million compared with \$6.8 million in last year's period.

Although Tab is witnessing a slowdown in new orders from the pace set earlier this year, which may continue for the next several months, "good profitability should be maintained even at this reduced level of demand," said H.W. Le Claire, president.

MAI Plans to Write Off \$1.1 Million Potter Debt

NEW YORK — Management Assistance, Inc. (MAI) will write off a \$1.1 million receivable from Potter Instrument Co. in the second quarter.

The decision, made after Potter filed under Chapter 11 of the Federal Bankruptcy Act, will be recorded as an extraordinary charge.

Although statements for the second quarter have not been finalized, President Raymond P. Kurshan said he expects the quarter to be profitable despite the charge.

The \$1.1 million is the remaining balance of a \$2.16 million receivable due from Potter under the terms of a 1970 agreement ending MAI's position as exclusive marketer of Potter tape drives.

EMM Scores Loss in First Quarter

HANTHORNE, Calif. — Electronic Memories & Magnetics Corp. (EMM) divulged "disappointing" results for the first quarter, when losses totaled \$657,000 compared with earnings of \$1.5 million in the year-ago period, when there was a \$785,000 profit.

Revenues were down 11% to \$23.7 million compared with \$26.3 million in the same quarter last year.

"Management had not been able to reduce operating ex-

penses as rapidly as volume declined, resulting in a loss for the period," Trade C. Taylor, EMM president, said.

"Demand continues soft for most of our products as our customers realign their inventory positions and manufacturing rates in response to recession conditions," he said.

"Management does not anticipate a meaningful upturn in business until late 1975 or early 1976."

Position Announcements

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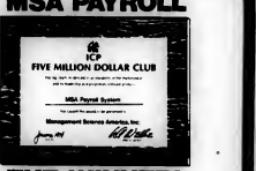
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NEW YORK — With Univac bringing in \$1.3 billion in revenues, a 15% rise over the year-ago figure, Sperry Rand Corp. registered record earnings and revenues for the year ended March 31, as well as for the fourth quarter.

Univac led the company in total revenues and earnings, and commercial orders for systems were 18% ahead of last year, while its worldwide installed DP base reached \$6.3 billion, a 15% increase over the year-ago period, said Chairman J. Paul Lyet.

Univac orders during the fourth quarter rose 22% above those of the same 1974 period.

Merging the Remington office equipment operations into Univac last August adversely impacted division results, but "the problems of these operations are under control and we are beginning to see the benefit of our restructuring programs," Lyet said.

"We are forecasting continued growth in revenue and net income in fiscal year 1976, although the magnitude of these increases may be smaller," Lyet said.

"Also, we anticipate the three-year pattern of consecutive re-

venues for comparable quarters may be hard to sustain," he observed.

For the year, Sperry Rand earned \$131.4 million or \$3.81 a share, including a \$4 million gain on credit for the sale of land, compared with a restated \$116.4 million or \$3.38 a share for 1974.

Results for 1974 were restated to reflect a change in accounting to expense R&D as incurred. The effect of this change to produce fiscal 1975 earnings by \$1.4 million and increase fiscal 1974 earnings by almost \$3.9 million, the firm said.

Revenue for the year reached \$3.04 billion, compared with \$2.61 billion in 1974.

International revenue rose 21% over last year and accounted for 43% of the total revenue, the firm said.

During the fourth quarter, revenues rose 11% to \$284.4 million or \$1.11 a share compared with \$34.7 million or \$1 a share in the same period last year.

Revenue reached \$823.2 million, up 14% over the \$724.4 million in the same quarter in 1974.

Sperry's corporate backlog at the end of the year totaled \$1.85 billion, up 7% over last year.

New orders received in 1974 were just under \$3 billion and were up 11% in the fourth quarter.

DEC Nine-Month Earnings Up a Bit From '74 Period

MAYNARD, Mass. — Digital Equipment Corp.'s third-quarter revenues were down 2.4% from the same period a year ago, while nine-month earnings eked ahead of last year's figure, \$28.6 million compared with \$28.4 million, or a 30% increase in sales.

Higher operating expenses in all areas contributed to the decline in third-quarter earnings, which nevertheless were ahead of those of the preceding second quarter.

The mix of DEC's sales may be changing as the company said the educational, business and

laboratory markets continue as stronger elements of the total business. The OEM market is "relatively flat" and the industrial and larger scale computer markets are growing somewhat more slowly than planned because of general economic conditions," the firm said.

The outlook for these and other markets remains positive, DEC said.

Worldwide Shipments

Worldwide shipments were in line with the firm's expectations, but new orders are increasing at a somewhat slower rate than a year ago, the firm said.

For the third quarter, revenues reached \$134.6 million compared with \$108.3 million a year ago, but earnings dropped to \$11.3 million or 95 cents a share, compared with nearly \$12 million or \$1.01 a share a year ago.

In the nine months, revenues rose to \$373.2 million compared with \$286.7 million. Earnings reached \$28.6 million or \$2.39 a share, compared with \$28.4 million or \$2.44 a share.

DEC's cost control program, begun earlier this year, has been maintained and is reflected in the results, the firm said.

Proceeds from the sale of \$75 million in cash funds debentures completed during the quarter have been used to reduce outstanding domestic short-term indebtedness and the balance invested on a short-term basis in anticipation of further growth and future business requirements, DEC said.

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Earnings Reports

ITEL		ADVANCED COMPUTER		DIGITAL EQUIPMENT	
Three Months Ended March 31		TECHNIQUES		Three Months Ended March 25	
Year	1975	1974	Years	1975	1974
\$/th End	6.28	8.57	\$/th End	1.74	1.13
Revenue	38,200,000	38,200,000	Revenue	4,077,000	3,312,000
Tax Crd	-----	150,000	Earnings	212,000	102,000
Earnings	2,100,000	2,066,000			
NATIONAL COMPUTER SYSTEMS					
Year	Ended Jan. 31				
\$/th End	1,157.1	1,175.1	\$/th End	1,175.1	1,174.1
Revenue	8,855	8,544	Revenue	6,33	6,33
Revenue	8,018,000	8,575,700	Earnings	67,171,000	78,850,000
Earnings	124,500	125,000	Earnings	2,544,000	2,544,000
Earnings	432,200	446,100			
BUNKER RAMO					
Three Months Ended March 31					
\$/th End	1,157.1	1,175.1	\$/th End	1,175.1	1,174.1
Revenue	8,855	8,544	Revenue	6,33	6,33
Revenue	8,018,000	8,575,700	Earnings	67,171,000	78,850,000
Earnings	124,500	125,000	Earnings	2,544,000	2,544,000
Earnings	432,200	446,100			
STORAGE TECHNOLOGY					
Three Months Ended March 25					
\$/th End	1,157.1	1,175.1	\$/th End	1,175.1	1,174.1
Revenue	8,855	8,544	Revenue	6,33	6,33
Revenue	8,018,000	8,575,700	Earnings	67,171,000	78,850,000
Earnings	124,500	125,000	Earnings	2,544,000	2,544,000
Earnings	432,200	446,100			
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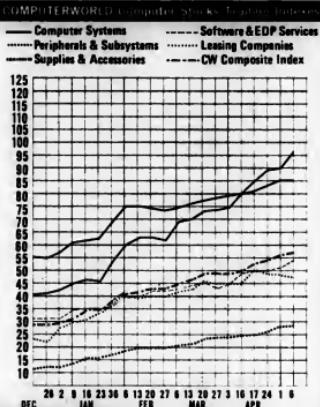
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		LOW	CLOSE	HIGH	WEEK	MONTH	PER
		RANGE	DAY 7	NET	PER	CHG.	PER
COMPUTER SYSTEMS							
1 BURGESS CORP	62-100	60 7/8	62 1/2	64 1/2	+8.0	+8.0	
2 COMPUTER AUTOMATION	2-16	6 1/8	6 1/2	6 3/8	-5.7	-5.7	
3 CENTER COMPUTER CORP	100-120	100 1/2	100 1/2	100 1/2	-10.0	-10.0	
4 CRYSTAL COMPUTER	5-18	18	18	18	-1/2	-1/2	
5 DATA SYSTEMS CONTROL	140-180	140 1/2	140 1/2	140 1/2	-36.0	-36.0	
6 DECIMAL EQUIPMENT	40-120	105 7/8	107 3/8	108 1/2	-3.0	-3.0	
7 ELECTRONIC ENGINEERS	4-11	9 5/8	9 5/8	10 1/2	-1/2	-1/2	
8 FEDERAL AUTOMATION	40-60	53 1/2	53 1/2	53 1/2	-16.0	-16.0	
9 GEN COMPUTER CORP	54-100	105 3/4	105 3/4	106 1/2	-18.0	-18.0	
10 HONEYWELL INC	130-80	130 1/2	130 1/2	130 1/2	-11.6	-11.6	
11 INTEGRATION CORP	5-15	13 3/8	13 3/8	13 3/8	-1/2	-1/2	
12 NEWGEN	2-7	9 9/16	9 9/16	9 9/16	-1/2	-1/2	
13 PDS COMPUTER SYSTEMS	5-15	15 3/4	15 3/4	15 3/4	-1/2	-1/2	
14 PERIN-FINER	15-40	20 1/2	20 1/2	20 1/2	-3/4	-3/4	
15 RAYTHEON CO	21-45	43 1/2	43 1/2	43 1/2	+2.6	+2.6	
16 SINGER COMPANY	10-16	14 1/2	14 1/2	14 1/2	-1/2	-1/2	
17 SYSTEMS ENGR. LABS	1-6	3 5/8	3 5/8	3 5/8	-1/2	-1/2	
18 TURBO SYSTEMS INC	1-6	13 1/2	13 1/2	13 1/2	-1/2	-1/2	
19 VARIAN ASSOCIATES	1-6	13 1/2	13 1/2	13 1/2	-1/2	-1/2	
20 WANG LABS	20-22	12 1/2	12 1/2	12 1/2	-3.0	-3.0	
21 WATKINS CHIP	90-120	81	84	84	-3.0	-3.0	
22 WATKINS CHIP	15-40	20 1/2	20 1/2	20 1/2	-3/4	-3/4	
LEASING COMPANIES							
1 CORTICO INC	1-3	7 1/4	7 1/4	7 1/4	+1.0	+18.5	
2 DEUTSCHE CORP	1-3	7 1/8	7 1/8	7 1/8	0.0	0.0	
3 COMPUTER INVESTS CORP	0-6	6 7/8	6 7/8	6 7/8	0.0	0.0	
4 COMPUTER RENTAL	1-6	1 1/2	1 1/2	1 1/2	0.0	0.0	
5 HCL INC	1-6	7 1/2	7 1/2	7 1/2	-1/2	-23.0	
6 LEASING CORP	3-6	3 1/2	3 1/2	3 1/2	1/4	1/4	
7 PDP RESOURCES	3-6	4 1/2	4 1/2	4 1/2	1/4	1/4	
8 CHARITY NET	3-6	4 1/2	4 1/2	4 1/2	1/4	1/4	
9 LEASING COMPUTER	3-6	4 1/2	4 1/2	4 1/2	1/4	1/4	
10 LTEL	3-7	6 1/2	6 1/2	6 1/2	1/4	1/4	
11 LEASING CORP	1-2	1 1/4	1 1/4	1 1/4	1/4	1/4	
12 LEASING CORP	1-2	1 1/4	1 1/4	1 1/4	1/4	1/4	
13 MDS INC	1-2	1 1/4	1 1/4	1 1/4	1/4	1/4	
14 MDS INC	1-2	1 1/4	1 1/4	1 1/4	1/4	1/4	
15 MDS INC	1-2	1 1/4	1 1/4	1 1/4	1/4	1/4	
16 PERIODIC CORP	2-10	9 1/2	9 1/2	9 1/2	-100.0	-100.0	
17 PERIODIC CORP	2-10	9 1/2	9 1/2	9 1/2	-100.0	-100.0	
18 PERIODIC CORP	2-10	9 1/2	9 1/2	9 1/2	-100.0	-100.0	
19 PERIODIC CORP	2-10	9 1/2	9 1/2	9 1/2	-100.0	-100.0	
20 U.S. LEASING	5-24	10 3/4	9 7/8	9 7/8	+9.8	+8.1	
PERIPHERAL							
1 ADDRESSOGRAPH-MULTICOPY	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	
2 ADVANCED MEMORY SYS	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	
3 ANDERSON JACOBSON	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	
4 APLIT-REFINER & NEW	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	
5 CALCOMP	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	
6 CENTRONICS INC	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	
7 COMPHARMATICS	1-10	10 1/2	10 1/2	10 1/2	-10.0	-10.0	

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Time sharing companies and remote terminal users— Now Leasco leases, installs and services the Vadic 1200 bps full duplex dial-up modem... anywhere you need it.

News item . . . Vadic announces that Leasco Data Communications Corp. will lease, install & maintain Vadic's VA3400 full duplex 1200 bps modem through their 53 office national service network.

What this means to time sharing companies

Now you can offer true full duplex 1200 bps service to dial-up customers without worrying about leasing, installing, or maintaining the modems. Leasco will do this for you. And since Vadic's miracle modem uses exactly the same line discipline as Bell's 103, you can change computer port speed to 1200 bps in minutes. What a great new service to offer your customers.

What this means to remote terminal users

Now your 120CPS terminals can operate at full speed. No longer do you have to plod along at 30CPS



or live with inefficient half duplex operation. Since your data will flow faster, your phone charges may be less too. Vadic's VA3400 has been called "the most significant advance in modem design in years." So contact your time sharing company or mail coupon today.

How Leasco's program works

The map shows that regardless of where you're located, there's an experienced Leasco engineer near you. Nerve center for this field engineering staff is the on-line, computerized National Service Center, ready to accept toll-free WATS phone calls 24 hours a day.

25% of all reported service problems are solved on the phone. And if a service call is needed, 95% is handled within 24 hours. With Vadic's VA3400, the



miracle modem that makes it easy to pinpoint problems, and Leasco's experienced service, you just can't lose. So act today.

These time sharing companies already offer VA3400 service

Applied Data
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Bowne Timesharing
Computer Network
Corp. (COMNET)
Computer Sciences
Comshare

Mail to VADC, 505 E. Middlefield Rd.
Mountain View, Ca. 94043

- I'm with a time sharing company
- I'm a remote terminal user
- I'm neither of the above but interested
- Send info on VA3400
- Send info on Leasco program
- Phone me at _____
- Name _____
- Company _____
- Address _____
- City _____ State/Zip _____

The VA3400

Vadic makes it



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